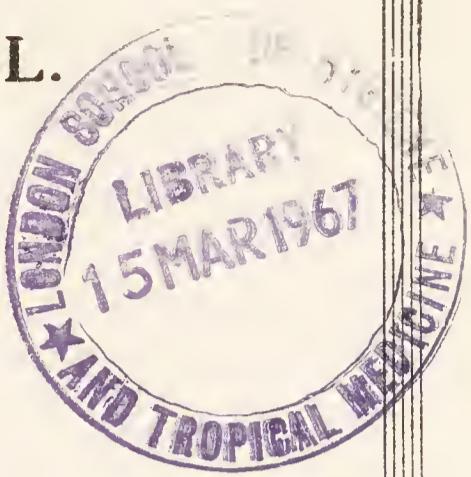


CITY OF LIVERPOOL.



EDUCATION COMMITTEE.

REPORT

ON THE WORK OF THE

SCHOOL HEALTH SERVICE

FOR THE YEAR

1947

BY

**W. M. FRAZER, O.B.E., M.D., Ch.B., M.Sc., D.P.H.,
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Medical Officer to the Education Authority

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S T A F F .

Medical Officer to the Education Authority.

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Barrister-at-Law (*Medical Officer of Health*).

Chief Assistant School Medical Officer.

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Senior Assistant School Medical Officer.

G. S. ROBERTSON, M.D., L.R.C.P., L.R.C.S., L.R.F.P. & S.

Whole-time Assistant School Medical Officers.

MURIEL C. ANDREWS, M.B., Ch.B., D.C.H. (From 1/9/47).	A. R. KENNEDY, M.B., Ch.B., M.R.C.S., L.R.C.P.
A. M. BROWN, M.B., Ch.B., D.P.H. (From 1/7/47).	MARY F. LACEY, M.D., Ch.B.
A. T. BURN, M.B., B.S.	GRACE E. McCONKEY, M.B., Ch.B., B.A.O., D.C.H.
D. J. DOHERTY, M.B., Ch.B., D.P.H. (From 1/7/47).	*LILIAN W. MASSEY, M.B., Ch.B. (Resigned 23/2/47).
*MARJORIE M. FLEMING, M.B., Ch.B. (Resigned 31/12/47).	*LILLIE L. MUNRO, M.B., Ch.B. (From 1/5/47 to 31/10/47).
M. GODWIN, M.B., Ch.B.	MARY PILLING, M.R.C.S., L.R.C.P. (From 1/9/47).
S. HOWARD, M.B., Ch.B.	*FLORA S. QUIN, M.B., Ch.B. (From 27/1/47).
F. P. IRVINE, M.B., Ch.B.	G. R. THORPE, M.B., Ch.B., D.P.H. (Resigned 31/3/47).
B. S. JARVIS, M.B., Ch.B., M.R.C.S., L.R.C.P., D.P.H.	(Re-commenced 1/7/47).
*HELEN KEITH, M.B., Ch.B. (Resigned 30/9/47).	

Part-time Assistant School Medical Officer.

ELIZABETH P. DUNCAN, M.B., Ch.B.

Senior School Dental Officer.

T. H. PARSONS, L.D.S., R.C.S.

Whole-time Assistant School Dental Officers.

A. BREWER, L.D.S.	J. N. SAWLEY, L.D.S.
†L. BROMLEY, T.D., L.D.S.	(From 10/2/47 to 31/8/47).
E. CROSBIE, L.D.S.	*MISS C. C. SLOAN, B.D.S., J. TYSON, L.D.S.
A. P. FINLAY, L.D.S., R.F.P.S.	L. C. WINSTANLEY, L.D.S.
L. A. JONES, L.D.S.	J. A. WOOD, L.D.S.
F. C. LITTLETON, L.D.S.	*W. F. WREN, B.D.S.
J. W. MARTIN, L.D.S.	
G. E. NEVINS, L.D.S.	

†With H.M. Forces on 31/12/47.

*Temporary Officers.

Part-time Assistant School Dental Officers.

J. A. BELL, L.D.S.
J. P. BLACOE, L.D.S.
H. W. MARTIN, L.D.S.

Part-time Specialist Officers.

Oculists.

ERNEST ALLAN, M.B., Ch.B., D.O.M.S. (Also Visiting Oculist for Classes for Partially-sighted Children).
DOROTHY A. BARTON, M.B., Ch.B., D.O.M.S.
DAVID BLACK, M.B., Ch.B., B.A.O., D.O.M.S.
JOHN MEYNELL, L.M.S.S.A., M.B., Ch.B.
DAVID RANKINE, M.B., Ch.B. (Also Oculist for Crown Street School for the Deaf).

Orthopaedic Surgeons.

F. C. DWYER, M.B., F.R.C.S., M.Ch.(Orth.).
J. P. HERON, M.B., Ch.B., F.R.C.S., M.Ch.(Orth.).
R. ROAF, M.A., M.R.C.S., L.R.C.P., B.M., B.Ch., F.R.C.S.E., F.R.C.S., M.Ch.(Orth.).
B. L. MCFARLAND, M.D., F.R.C.S., M.Ch.(Orth.). (*Resigned 27/3/47*).

Surgeon i/c of Aural Scheme and Aurist for Crown Street School for the Deaf.

COURTENAY YORKE, M.D., F.R.C.S.

Approved Officers for Educationally Sub-normal Children.

WILHELMINA DEVLIN, M.B., Ch.B., D.P.H., D.P.M.
F. HOPKINS, M.D., B.Ch., B.A.O.

Speech Therapist.

DOROTHY GLEDSDALE, L.C.S.T.

School Nurses, Etc.

Superintendent: Miss M. SNODDON.

Supervisor: Miss B. M. SPELLER.

Temporary Supervisor: Miss W. K. POOLE.

Also:—46 Permanent nurses.
16 Temporary nurses.
3 Auxiliary nurses.
2 Orthopaedic nurses.
14 Clinic Helpers (including 11 part-time).
8 Dental Attendants.

Senior Administrative Assistant: Mr. F. J. GELDART.

Also:— 48 Clerks.

CITY OF LIVERPOOL.

EDUCATION COMMITTEE.

REPORT of the MEDICAL OFFICER to the Education Authority for the Year ended 31st December, 1947.

Introduction.

The Medical Officer submits, herewith, his report on the work of the School Health Service during the year 1947.

1. In the report for 1946 the difficulty of obtaining school medical officers was mentioned. During the current year the situation somewhat improved, since though there were five resignations, seven appointments were made to the staff, so that at the end of the year there were sixteen whole-time and one part-time school medical officers.

2. It was with much regret that the Committee received from Mr. Bryan McFarland his decision to give up, on account of the pressure of other work, his association with the Committee's orthopaedic clinic work. To Mr. McFarland, who has been the Senior Orthopaedic Surgeon to the clinics since their inauguration in 1930, the credit is largely attributable for the undoubted success which the scheme has achieved.

3. Early in the year the Committee obtained from the Ministry of Education permission to add to the list of prescribed periodic medical examinations of school children the inspection of pupils at the age of 8 years in maintained primary schools and also pupils in attendance at maintained secondary schools at the age of 14+ years and on each succeeding year.

It was felt that the medical examination of the 8-year group should not be discontinued as it is at this age that important physical defects might arise. It was also considered that the examination of children remaining on at secondary schools after the age of 14+, and particularly those attending secondary, technical and grammar schools, should not be left until their final year at school but that the period from the last year in the primary school to the age of 14 years was a sufficiently long period without an examination.

4. The combination of the effects of the war years and the introduction of the definition of educationally sub-normal pupils has led to a greatly increased demand for suitable special education. The value of this type of provision has been amply demonstrated in the case of a number of backward children who have made such rapid progress that six to twelve months in a special school has enabled them to be returned to their ordinary schools with attainments comparable with those of their fellow pupils. Suitable provision for many such children would be special classes in the ordinary schools and the opening of such special classes would do much to lessen the present long list of children awaiting admission to the special schools.

5. The definition of educationally sub-normal pupils is a much broader one than the former definition of "feeble minded" under the Education Act of 1921, and for this reason the policy of not sending educationally sub-normal children to an approved school should be reconsidered. Considerable difficulty is found in trying to deal with a certain percentage of the juvenile delinquents in the special boarding schools for the educationally sub-normal and the question of establishing special approved schools for certain of these educationally sub-normal pupils should be considered.

6. Early in the year the Minister of Education requested the Authority to consider the establishment of a special school for children affected by cerebral palsy. Recent work, initiated in America and developed later at Queen Mary's Hospital at Carshalton, has shown that with special treatment much more can be accomplished in their betterment than had formerly been thought possible. After full investigation of the problem the Committee decided to make provision for the special treatment required by making use of some of the places at the Children's Rest School of Recovery, Greenbank Lane, a boarding school

for physically handicapped pupils. Since the close of the year under review personnel sufficient for the commencement of the scheme have been appointed and special educational treatment for a small number of cerebral palsy cases will probably begin in the autumn term of 1948.

7. The Committee have not yet succeeded in finding premises suitable for use as their residential school for the education of epileptics. Such provision is urgently needed as the number of places available in the existing schools is entirely inadequate.

8. There is also a need for more boarding places for both the physically handicapped and more serious cases of delicate children. Such a school should be located in the country since the chest cases in particular do so much better away from an industrial atmosphere.

9. The Medical Officer is indebted to the Director of Education for information supplied with regard to certain sections of this report, relating in particular to the work in connection with the Special Schools and the School Meals Service.

10. The Medical Officer would also like to record his appreciation for the assistance given by Professor Rosenhead and Mr. Plackett in analyzing certain of the departments statistics referred to on pages 17 and 69.

NUTRITION.

11. In previous years at the annual periodic inspections a classification had been made of the "nutrition" of the children under the heading of "Excellent," "Normal," "Slightly subnormal" and "Bad."

During the course of the year, the Ministry of Education requested that instead of grading children according to their nutrition they should be graded according to their "General Condition" under the categories of "Good," "Fair" and "Poor." This new method of grading was not introduced until the end of February.

No uniform method of procedure had been suggested in applying the new classification of "Good," "Fair" and "Poor," consequently a certain amount of confusion arose as school medical officers took varying views as to which of the new categories children should be placed in.

For this reason two separate tables are shewn in Appendix "A" to this report, and for convenience of reference these are produced below, shewing the percentages of the classifications under the old method and those under the new method :—

UNDER THE OLD METHOD (NUTRITION).

Excellent	...	...	10·15%
Normal	...	...	88·94%
Sl. subnormal	...	...	·90%
Bad	...	...	·01%

UNDER THE NEW METHOD (GENERAL CONDITION).

Good	...	...	74·60%
Fair	...	...	24·15%
Poor	...	...	1·25%

After the above tables had been prepared, the Ministry issued advice in order to secure more uniformity amongst authorities. The chief difficulty appears to have arisen over the new grading of the cases formerly regarded as being of "normal" nutrition which are now regarded only as being of "fair" general condition, whereas most school medical officers had been classifying such children as "good." For the year 1947, therefore, it is not possible to make any reliable observations on the clinical assessment of nutrition according to the findings of the assessment of their "general condition."

It would appear, however, reasonable to assume that approximately 1 per cent. of the children had poor nutrition.

12. There is another way of studying the question of nutrition; however, by analysing certain physical measurements, namely, the average heights and weights of groups of children.

For a considerable number of years, the School Health Service has kept records of average heights and weights of the school children in certain selected schools, though during recent years the average weights only have been given in the Annual Reports.

In the report for 1946 diagrams were shewn giving the average weights of these selected boys and girls at the ages of 5, 8 and 12 years respectively for a number of past year, and the Medical Officer drew attention to a slight general drop in the average weights for the year 1946 compared with the year 1945 and owing to the interest in this matter the year 1947 has now been included for both heights and weights. These are shewn in Figures 1, 2, 3 and 4.

COMPARATIVE AVERAGE HEIGHTS OF BOYS AGES 5, 8, AND 12.

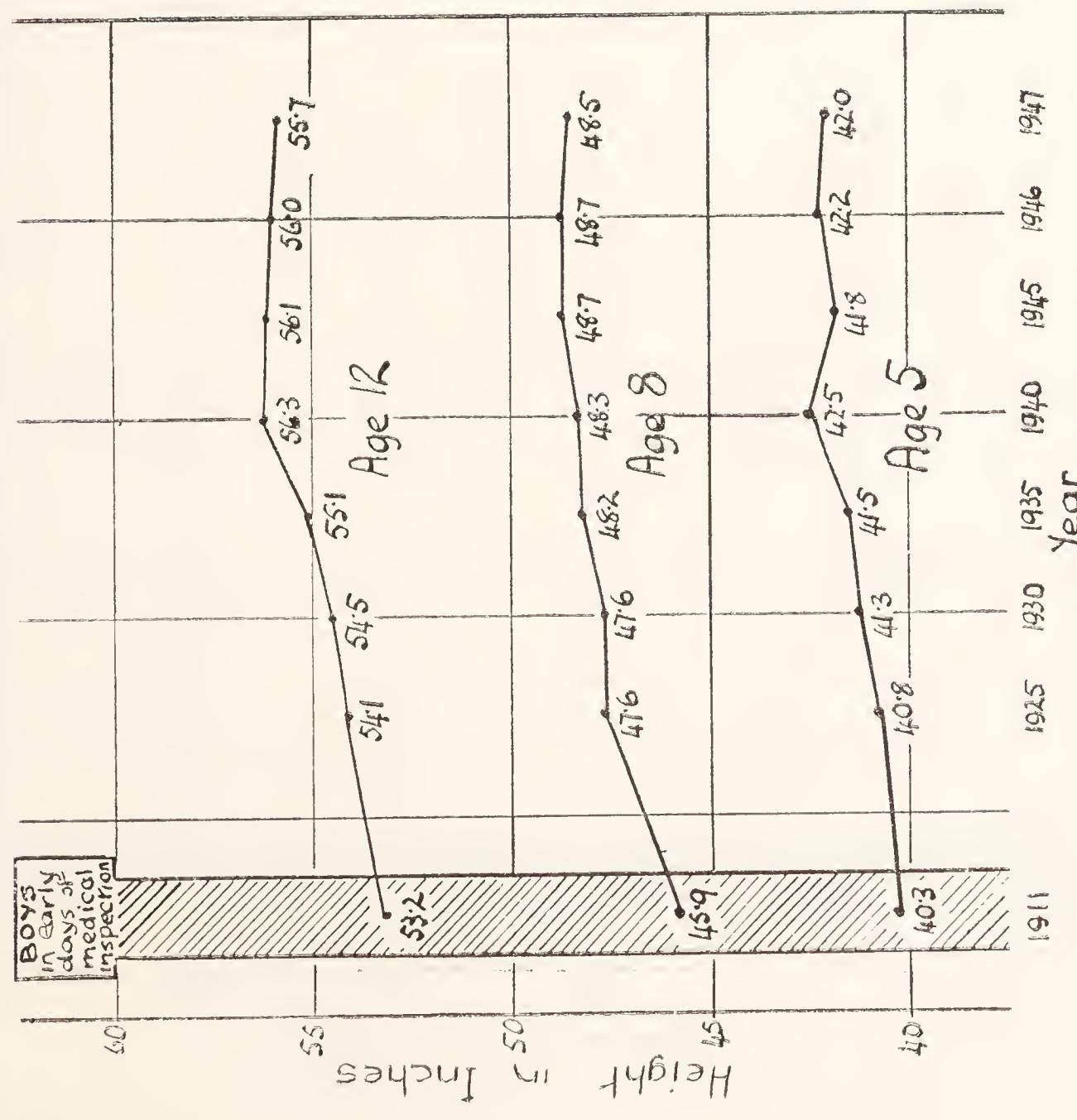


FIGURE 1.

COMPARATIVE AVERAGE HEIGHTS OF GIRLS AGES 5, 8, AND 12.

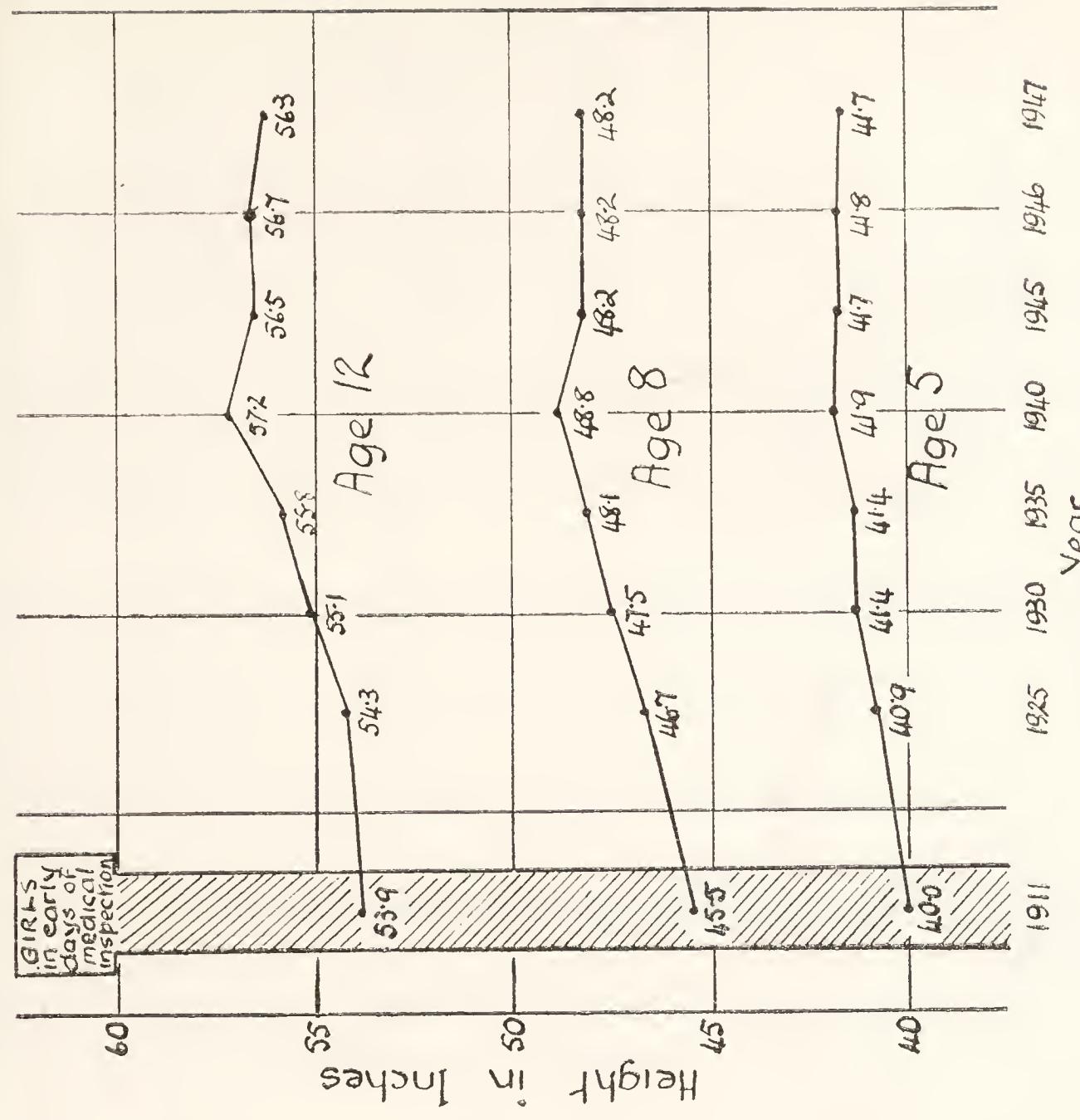
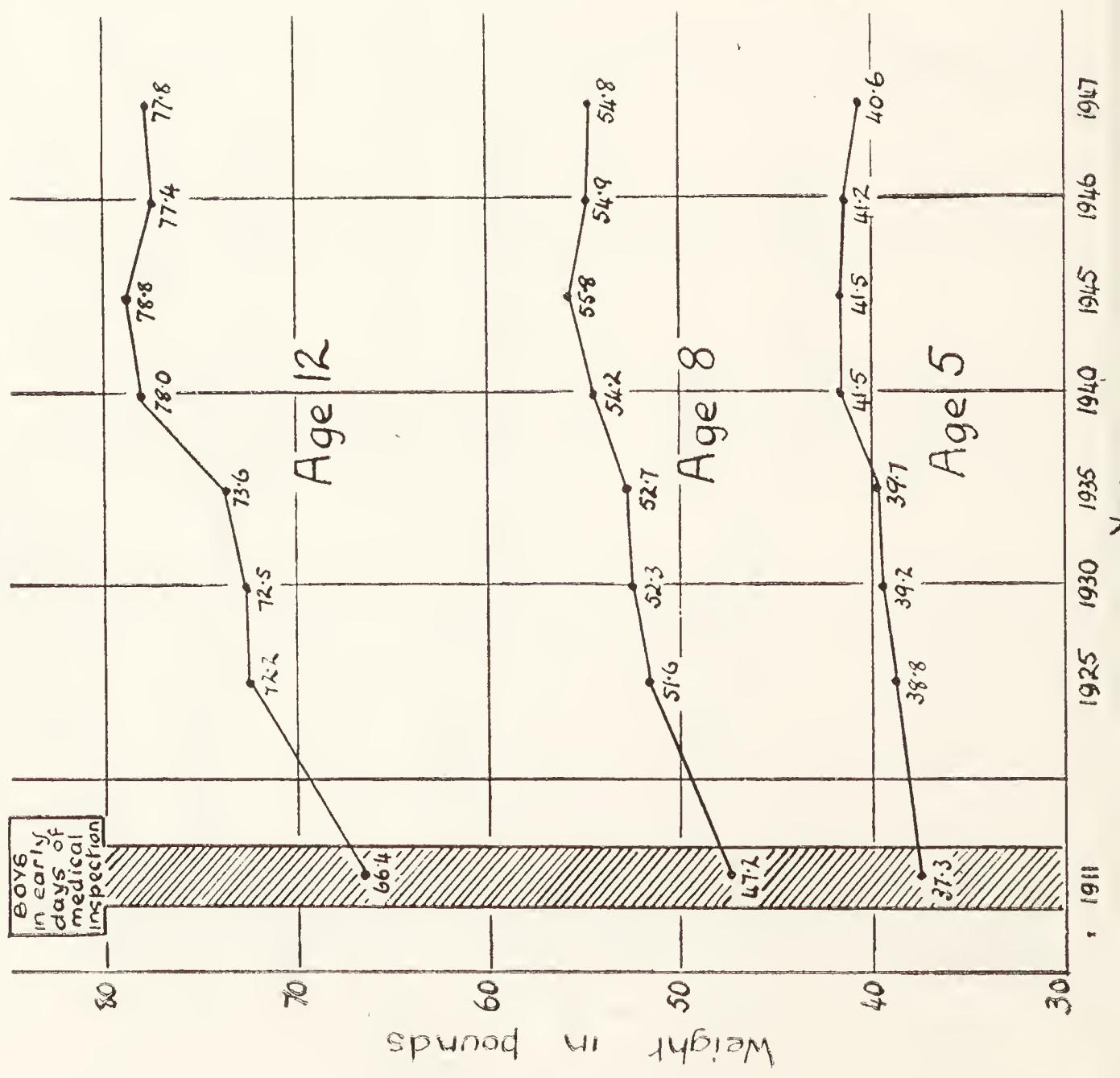
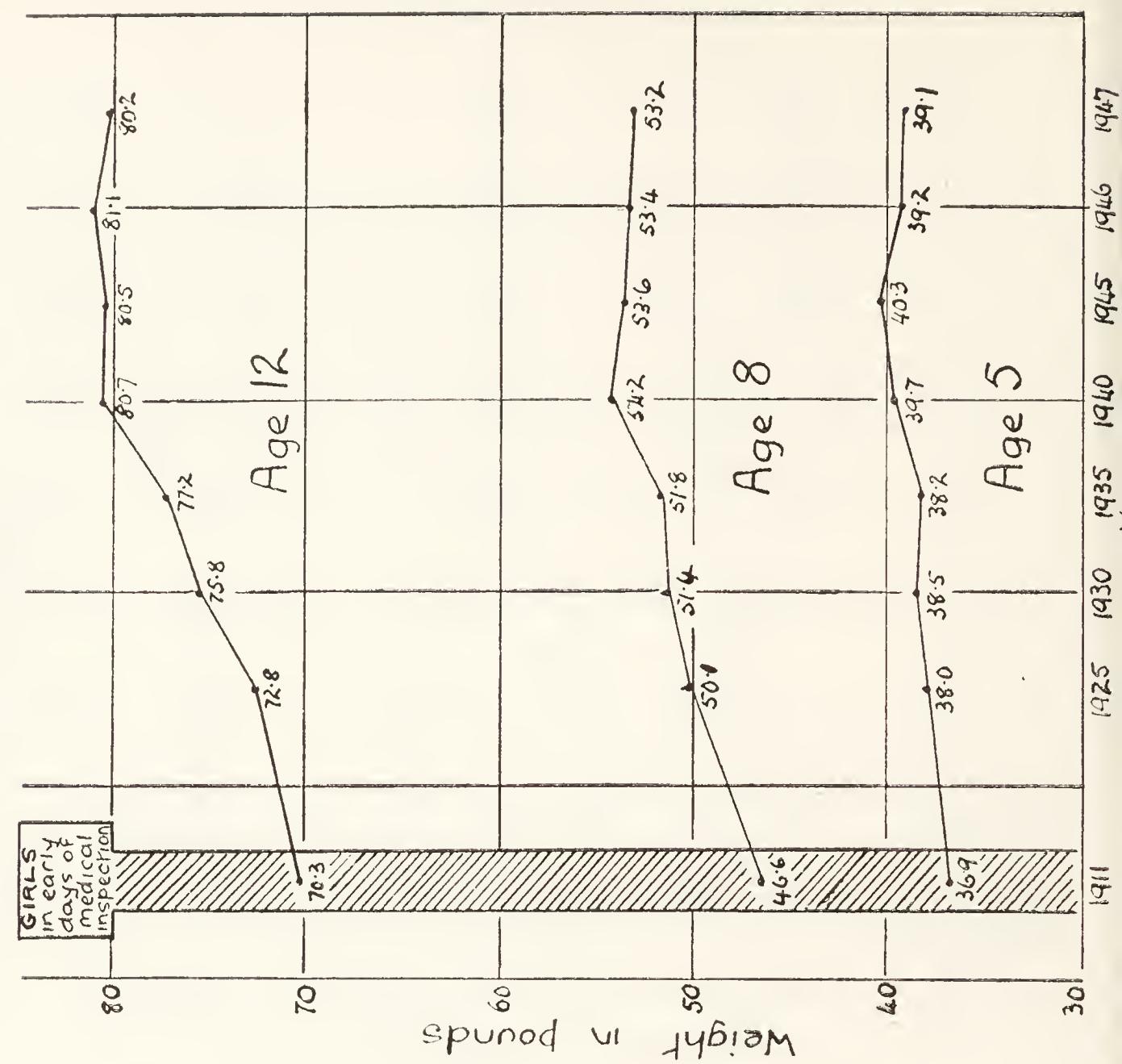


FIGURE 2.

COMPARATIVE AVERAGE WEIGHTS OF BOYS AGES 5, 8, AND 12.



COMPARATIVE AVERAGE WEIGHTS OF GIRLS AGES 5, 8 AND 12.



It will be seen from these diagrams that, so far as average weights of these selected children are concerned, the trend for both boys and girls in attendance at these schools is a slight drop, with the exception of the boys at 12 years of age where a slight increase is recorded. In the case of the average heights, the girls at age 8 shew no change whereas a slight drop is recorded at the ages of 5 and 12 years, and in the case of boys, a slight drop is recorded for each of the three age groups.

13. The following table shews the comparison of the average heights and weights of boys and girls in these schools at the ages of 5, 8 and 12 years for the year 1947 compared with the year 1946, divided into groups representative of "good," "fair" and "poor" neighbourhoods. The sign “-” signifies a loss, and the sign “+” signifies a gain.

TABLE I.

TABLE SHEWING THE LOSS OR GAIN IN AVERAGE HEIGHTS AND WEIGHTS FOR THE YEAR 1947 COMPARED WITH THE YEAR 1946.

Age.	Type.	Heights (in inches).		Weights (in lbs.).	
		Boys.	Girls.	Boys.	Girls.
5 years ...	Good	-0.5	-0.1	-1.6	-1.0
	Fair	-0.1	-0.1	-0.3	-0.5
	Poor	-0.2	-0.3	-0.6	-0.7
8 years ...	Good	-0.2	+0.3	-0.8	+0.2
	Fair	-0.2	+0.1	-1.6	-0.7
	Poor	-0.4	-0.6	No change	-1.3
12 years ...	Good	No change	-0.1	-0.9	-1.3
	Fair	-0.3	-0.3	-0.6	-1.3
	Poor	-0.5	-0.6	+0.9	+0.4

It is interesting to note from this table that the highest losses are amongst the "good" schools.

14. At the request of the Ministry of Health, the Medical Officer has prepared data of average heights and weights on the following lines:—

- (1) A base line for each group has been obtained by averaging their data for the years 1925/26/27.

(2) The pre-war figures are shewn by averaging the data for the years 1937/38/39.

(3) The present figures are shewn by averaging the data for the years 1945/46/47.

The above data is shewn in the diagrams in Figures 5, 6, 7 and 8.

COMPARATIVE AVERAGE HEIGHTS OF BOYS IN THREE 3-YEAR PERIODS.
AGES 5, 8 AND 12 YEARS.

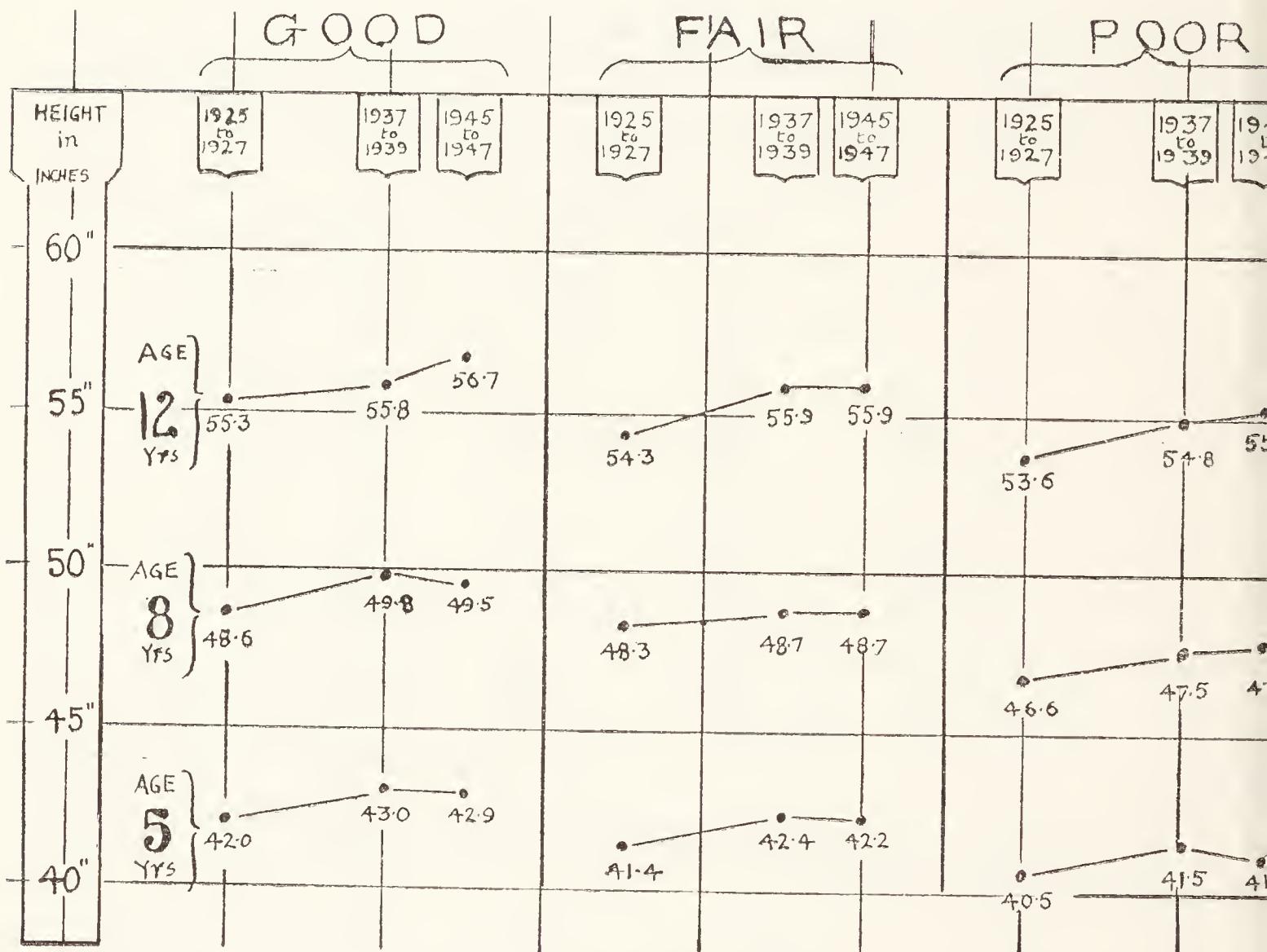


FIGURE 5.

COMPARATIVE AVERAGE HEIGHTS OF GIRLS IN THREE 3-YEAR PERIODS.

AGES 5, 8 AND 12 YEARS.

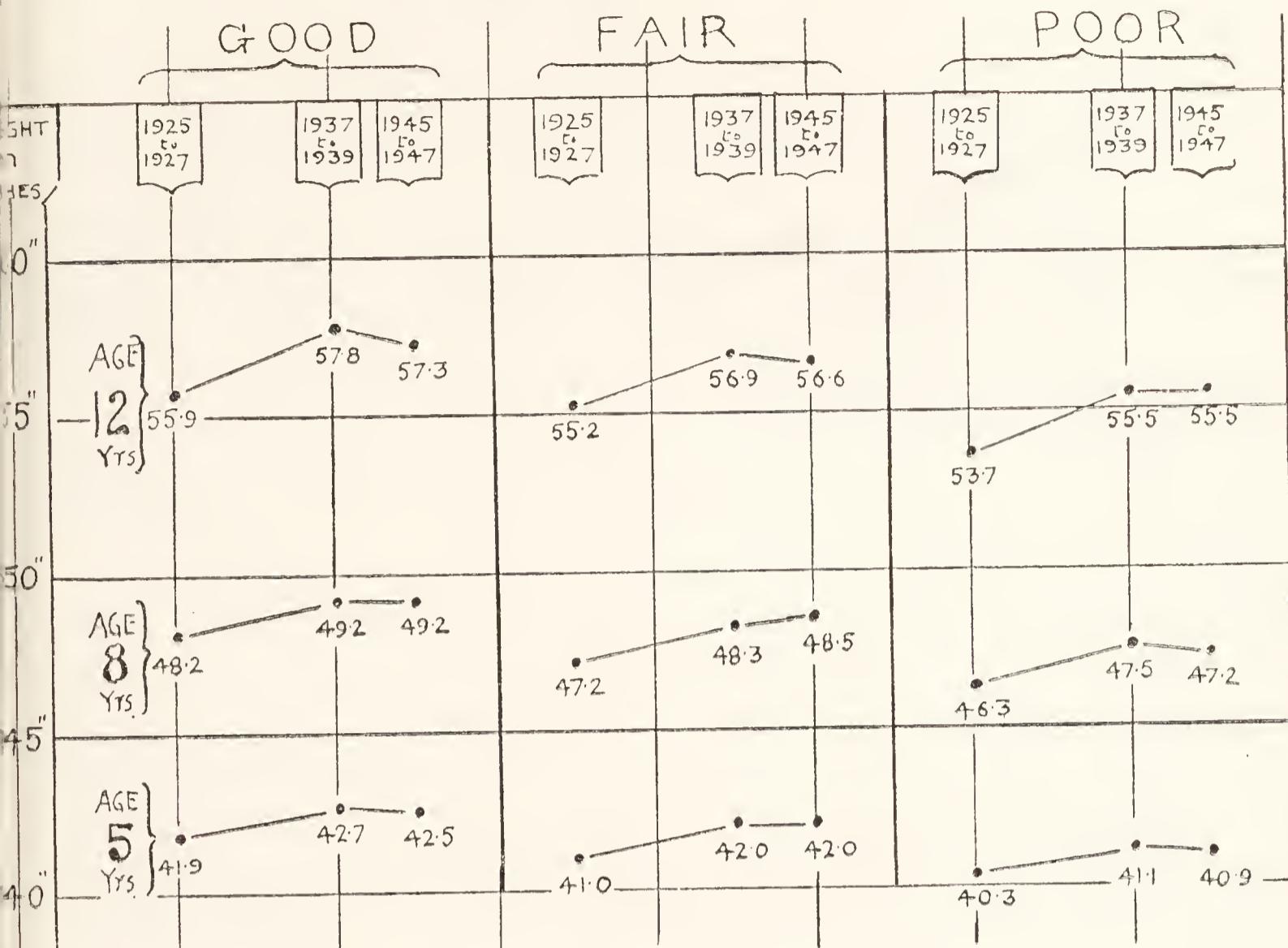


FIGURE 6.

COMPARATIVE AVERAGE WEIGHTS OF BOYS IN THREE 3-YEAR PERIODS.

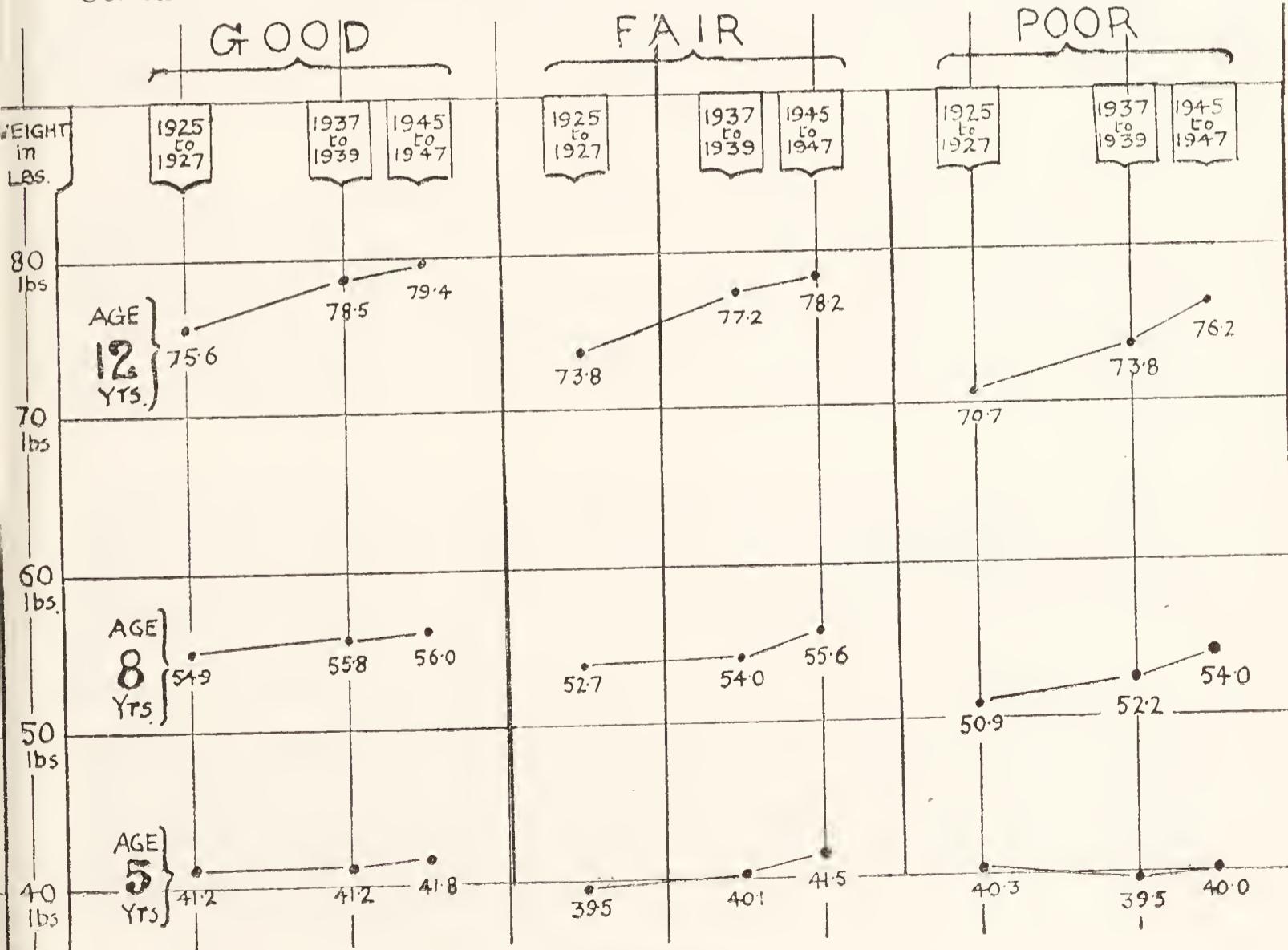


FIGURE 7.

COMPARATIVE AVERAGE WEIGHTS OF GIRLS IN THREE 3-YEAR PERIODS.

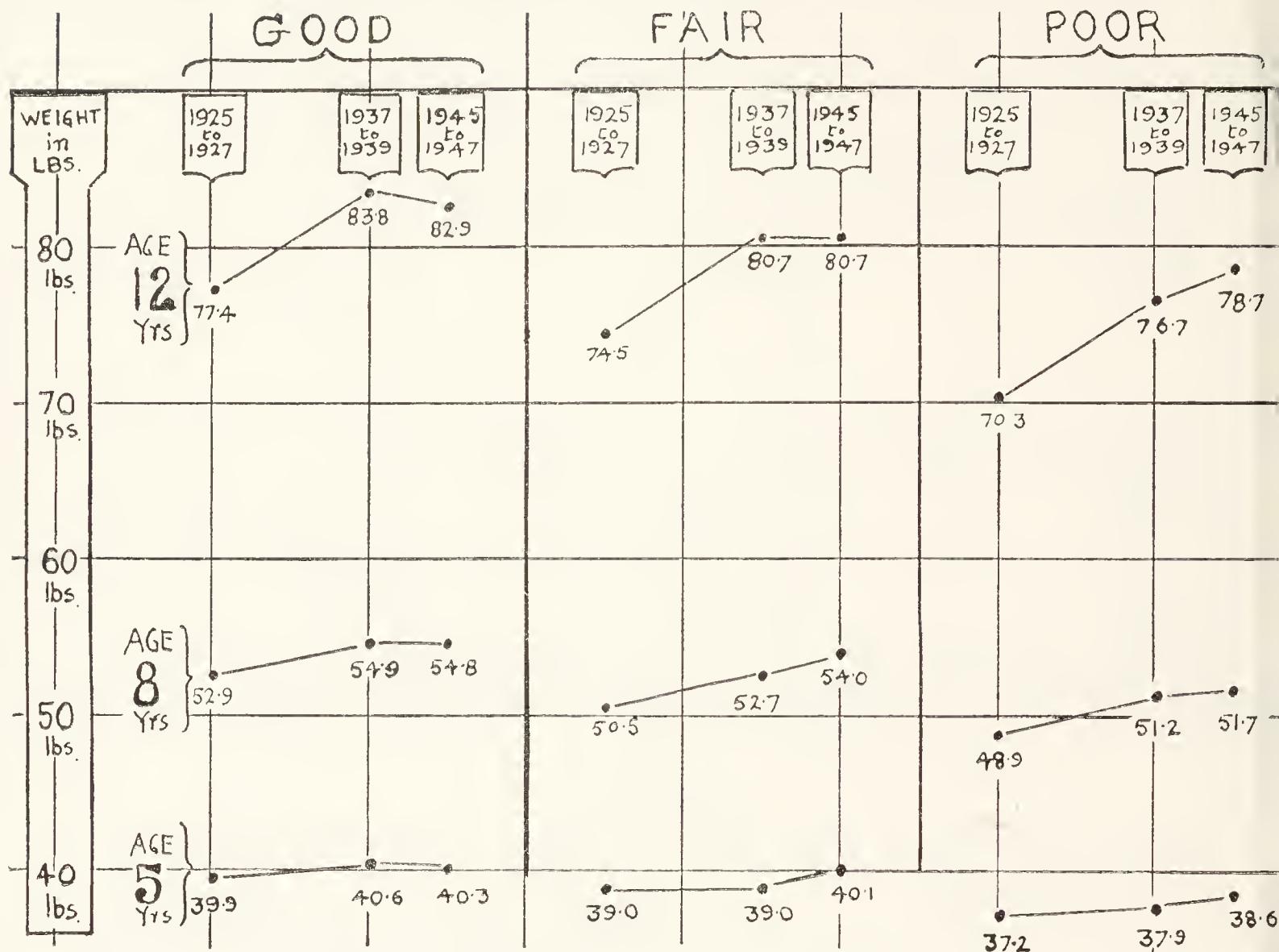


FIGURE 8.

A general inference from these diagrams is that when a comparison of the 1945/47 groups is made with 1937/39 groups, so far as average weights are concerned, in the case of boys, gains are recorded, though slight in some cases. In the case of girls, however, though slight gains are recorded in fair and poor schools, there is a slight loss in good schools.

With regard to average heights, slight losses are recorded generally in the case of the girls, but the average heights of the boys appear to be fairly well maintained, although there is a slight drop in the 5 year olds.

15. It should be pointed out, however, that children have been weighed and measured in a fixed group of schools and the results cannot, therefore, be taken as representative of Liverpool school children as a whole. The purpose of the method used was to follow these measurements from year to year so far as they applied to the children attending these particular

schools. As the Medical Officer appreciated that the drawing of deductions as to the physique of the Liverpool children as a whole from this method of investigation might not be justified according to strict statistical requirements, he accordingly asked Professor Rosenhead, of the University Department of Applied Mathematics for his opinion from the statistical point of view on the apparent drop in weight of certain of the groups. Professor Rosenhead and Mr. R. L. Plackett, M.A., Lecturer in Mathematical Statistics, undertook to review the statistical information obtained by the School Health Service.

16. Time did not permit of a full analysis of all the figures, and attention was concentrated on the weights of boys in the age group 8. An interim report setting out the main lines of the investigation and conclusions is given in Appendix "C." Professor Rosenhead and Mr. Plackett confirmed that "As far as the weights of boys in the age group 8 in the particular schools of the School Health Service enquiry are concerned the evidence submitted is just suggestive of a downward trend in the mean weight," and also confirmed that this result applied only to the schools in the enquiry and not to Liverpool school children in general. They recommend that this work be extended in order to obtain a measure of the health characteristics of Liverpool children as a whole. Their detailed recommendations are outlined in the Appendix "C."

SCHOOL MEALS SERVICE.

Kitchens and Canteens.

17. Owing to a steadily increasing demand for school dinners, it has been necessary strictly to regulate further increases in the number of meals.

The output of dinners of the majority of the kitchens is far in excess of their reasonable production, and dining accommodation is also inadequate in many schools. It has, therefore, been necessary to fix an upper limit to the number of meals supplied to schools until additional kitchens and dining-rooms are available.

There is considerable delay in carrying out approved schemes for the provision of additional kitchens with a total output of 32,700 meals and dining accommodation for 16,250 meals. Some of these projects were

approved in 1946, and it is expected that only a few of these schemes will be completed during 1948.

Transfer of British Restaurants and Ministry of Food Cooking Depots.

18. On the 1st April, 1947, six British Restaurants with kitchens and dining-rooms, three British Restaurants with dining-rooms only, together with eight Ministry of Food Cooking Depots, were transferred to the Education Committee for the exclusive use of the School Meals Service. In addition, it is proposed to convert the Garston British Restaurant into a Central Kitchen for 750 meals.

Prior to transfer, the Cooking Depots were engaged almost exclusively in the preparation of meals for the School Meals Service. The ex-British Restaurants, however, were a great acquisition for the School Meals Service as the dining accommodation became available for children, and it was possible to increase the number of meals sent to Canteens on other premises.

New Kitchens and Dining Rooms.

19. During the year, the undermentioned kitchens and/or dining-rooms were opened, viz. :—

	Accommodation				
(a) COMBINED KITCHENS AND DINING ROOMS (HUTS).	2 sittings.				
Finch Hall, Colwell Road C. School	...	...	...	...	750
Booker Avenue C. School	...	...	...	...	375
Kingsthorne Road C. School	...	...	...	...	375
(b) DINING ROOMS ONLY (HUTS).					
Gilmour, Heath Road, C. School	...	...	...	...	320
St. Cuthbert's R.C. School	...	...	...	...	250

Number of Dinners.

20. The numbers of dinners supplied from 43 kitchens to pupils in maintained schools on a day selected in each of the months of February and October of the year under review were as follows:—

	1947.				
	February.			October.	
No. of children present in the schools on day selected...	104,023	115,126
No. of pupils provided with dinners	43,443	49,856
Percentage of pupils present who were supplied with dinners	41·76%
No. of Canteens	212
No. of Schools and Departments served	403	400

In addition, dinners were also supplied to the following:—

Special Schools	...	...	...	...	...	...	1,035
Nurseries	...	...	...	...	...	...	1,022
Adults—Canteen and Teaching Staffs	...	...	...	...	...	...	4,184
							—
Total (Average daily)	...	...	...	...	...	...	6,241
							—

The total numbers of dinners supplied during the year was over 11,500,000 (children 10,590,000; adults 910,000).

Milk.

21. The numbers of pupils taking milk under the Milk in Schools Scheme on a day selected in each of the months of February and October were as follows:—

1947.

	February.	October.
No. of pupils taking milk	...	99,219
Percentage of pupils present supplied with milk...	95.38%	96.2%

DEFECTIVE VISION.

22. At the periodic medical examinations the total number of children found to have some defect of vision was 4,783 (16.9 per cent.), of which 1,053 (3.7 per cent.) were of a minor degree and recorded for observation only. Amongst the entrants, 306 were found to have defective vision, mostly cases of squint.

The incidence of squint amongst the age groups inspected was 4.3 per cent. whilst that of the entrants alone was 5.5 per cent.

In addition to the cases of defective vision discovered as a result of the periodic examinations 1,443 cases were seen as "specials."

The number of new cases treated under the Committee's scheme was 3,492. The number re-examined at the clinics was 5,110. These numbers do not represent the total number of clinic attendances, since many children with amblyopia received intensive treatment, attending weekly, or oftener, over extended periods.

23. Under the arrangements made with the Health Committee for the treatment of squint in pre-school children, 418 children were examined by an oculist and glasses were provided in 262 of these cases.

24. Dr. Allan in his report states: "Errors of refraction are in a great majority of cases the determining cause of eye strain, and the small errors, those capable of correction by a strong effort of accommodation, are the most likely to give rise to acute reflex symptoms. It is the over-wrought muscle that goes into spasm and cramp, and the symptoms are identical in every part of the body where unstriped muscle is found. In both the eye and the heart, for example, exhaustion of the muscle gives rise to pain and other acute symptoms which are precipitated by effort and pass off with rest. In treatment, therefore, the all-important thing in the first instance is to try to form a correct estimate of the working power of the muscle. It follows, therefore, when dealing with the eye, that while any error of refraction must be carefully corrected in order that the ciliary muscle may do its work under the most favourable conditions, i.e. without any handicap, every effort must be made to develop and strengthen the patient. Rest is the best of all remedies, and the ophthalmologist can easily demonstrate how an exhausted ciliary muscle can be reinvigorated and its efficiency restored by means of suitable lenses. It may, indeed, be stated as an axiom that the success of a therapeutic agent in any circumstances is in direct proportion to its power of securing physiological rest for the organ affected.

"What is true of hypermetropia, is equally true of myopia and especially of astigmatism. It is not enough simply to adjust glasses suitable for the correction of the error of refraction. A quick estimate must at the same time be made of the patient's general health, for it is most important to remember that though the demand for work made upon the ciliary muscle may not be unreasonably great in itself, yet it may be altogether excessive in relation to the child in whom it is made. The problem of the child suffering from progressive myopia concerns the family doctor just as much as the ophthalmic surgeon. It is well known that serious results are most liable to occur when the child is growing too rapidly—when there is a disturbance in the proper ratio between growth and weight—when the child is not taking its breadth with its height, as is often said."

25. Dr. Rankinc, in his report, after calling attention to the fact that the work at the eye clinics is not restricted to the provision of glasses, continues as follows: "The primary purpose of the Defective

Vision Clinics is to ensure that visual defects which may interfere with a child's education may be corrected as far as is possible. It would, however, be quite wrong to suppose that these clinics are simply centres for the provision of glasses. In practice, the scope of the work at the clinics is very wide indeed.

"Each child presented is examined for the presence of any disease of the eyes, deformity, etc., as well as to decide whether glasses are necessary. Advice is given on the treatment of minor ailments of the eyes, and hospital treatment is recommended for the more serious conditions.

"In previous reports the extensive work carried out in the clinics on the prevention of loss of sight in squinting eyes has been described in some detail, and on this occasion one would simply stress the importance of this work. Nowadays, such loss of sight is almost inexcusable.

"This year I feel that I must refer to a paragraph which appeared a few months ago in the daily Press which may have given rise to some alarm among parents. It stated that one child in every four leaving school was near-sighted and that, by the age of twenty, anything up to 30 per cent. were short-sighted. This allegation was not made by doctors, and ophthalmologists will agree that it is, happily, very far from the truth.

"There is no evidence whatsoever, that myopia is due to mis-use of the eyes, and, in simple myopia, all the evidence goes to suggest that deterioration is less likely if the eyes are given their normal amount of work, provided that the proper glasses are worn."

EAR, NOSE AND THROAT CONDITIONS.

26. The organisation of the Aural Clinics has been maintained on similar lines to those of preceding years. The Aural Clinics are held at the following school clinics:—Everton Road, Blackstock Street, Norris Green, Garston and Dovecot.

During the year, 8 cases were considered by the Consultant Surgeon to require radical mastoid operations and were accordingly referred to Alder Hey Hospital.

The importance of early treatment in cases of middle ear suppuration is shown by a comparison of results obtained throughout the year in the treatment of acute and chronic cases respectively.

Approximately one-fifth of the cases of acute suppurative otitis media referred for treatment at the aural clinics failed to complete treatment. Of 95 cases which did complete treatment suppuration ceased in all but two of the cases.

Approximately one-third of the cases of chronic suppurative otitis media referred for treatment at the aural clinics failed to complete treatment. Of the 172 cases which did complete treatment suppuration ceased in 103 (60 per cent. approximately).

Hearing Defects.

The commonest type of deafness seen at the clinics has been middle ear deafness. In the great majority of cases this has been caused in one of two ways, either by the destruction (generally partial) of the middle ear mechanism, or by the immobilisation (generally partial) of this mechanism.

The destruction of this mechanism is generally the result of suppuration whilst its immobilisation is frequently caused by a subacute infection which may have passed unnoticed or though noticed has been ignored by the patient. In these cases of immobilisation, treatment directed to any unhealthy nose and throat conditions as well as to the middle ear, has usually restored serviceable hearing.

Audiometry.

27. At least one session a week has been given to audiology. Audiograms are made of those cases which fall below the level of Educational Grade I. Useful information has thus been obtained in discovering cases of high tone deafness and Island deafness. This apparatus is also of considerable value in assessing the extent of improvement in hearing consequent upon treatment.

28. The following table gives the types and numbers of cases treated at the aural clinics:—

TABLE 2.
Aural Clinics.

Number of children who attended for treatment 1,315
Total number of attendances at the clinics 5,496

Defect	Total	Dry or Healed	Improved or I.S.Q.	Exam. only No treatment given.	Still under treatment	Failed to complete treatment	Referred to Hospital or own Doctor	Referred to M.A.C. or other Clinics	Referred to School for Deaf
Acute Otitis Media	147	93	—	4	2	29	17	2	—
Chronic Suppurating Otitis Media	133	61	4	20	8	39	1	—	—
Mastoid Cavities	19	4	4	4	4	1	—	2	—
Deafness due to Tonsillitis and Adenitis	79	—	36	1	8	27	5	2	—
Deafness due to Rhinopharyngitis	56	—	24	2	6	20	—	1	3
Deafness due to Tonsillitis and Adenitis	32	—	17	5	—	7	2	1	—
Deafness due to Rhinopharyngitis	195	—	122	32	7	13	19	—	2
Deafness due to Tonsillitis and Adenitis	6	—	—	4	—	1	—	1	—
Deafness due to Rhinopharyngitis	24	—	1	1	1	2	—	2	17
Tonsillitis and other conditions	177	68	11	71	3	14	4	6	—
Pharyngeal and Throat conditions	303	17	73	63	18	78	29	25	—
TOTALS	... 1,493	346	319	210	99	361	90	46	22

Minor Operations 78
Referred to Alder Hey Hospital for Mastoid Operation 8

29. At the periodic examinations of the pupils the number found to require treatment for unhealthy tonsils or adenoids was 807, which represents 2·3 per cent. of the children examined. The number requiring to be kept under observation was 2,915 or 8·4 per cent.

In addition, 759 children were presented as special cases, and of these 408 were found to require treatment.

30. Owing to the shortage of nursing staff at Alder Hey Hospital it was not found possible to arrange for a regular allocation of beds at the disposal of the Committee, and as the number of beds available was totally inadequate to meet the number of applications received, endeavours were made to find supplementary accommodation. The Health Committee accordingly arranged for cases to be treated also at the City Hospital, Fazakerley, and these additional arrangements will come into operation in January, 1948.

The cases treated at Alder Hey Hospital during the year 1947 were as follows:—

Tonsils and Adenoids removed	...	...	...	335
Tonsils only removed	...	...	...	81
Adenoids only removed	...	...	...	24
				440

DENTAL INSPECTION AND TREATMENT.

REPORT BY MR. T. H. PARSONS, THE SENIOR SCHOOL DENTAL OFFICER.

31. The following table shews the work carried out under the dental scheme for children attending the Primary and Modern Secondary Schools:—

TABLE 3.

		1945	1946	1947
Number of children examined in school	...	73,709	91,942	100,970
Number of children requiring treatment	...	48,343 (65·5%)	58,818 (63·9%)	60,467 (59·8%)
Number of cases accepting treatment under the Dental Scheme	...	31,422 (64·9%)	33,864 (57·5%)	41,344 (68·3%)
Number of cases treated	...	27,083	33,298	32,980
Number of schools concerned	...	143	167	182

32. During the year one of the dental officers resigned in order to take up a similar post under another Authority, and, at the end of the

year, one was still retained in H.M. Forces. The services of the part-time officers were, therefore, retained and, at the end of 1947, the total dental staff available was the equivalent of 15 whole-time officers. As the establishment at present authorised provides for the employment of 19 officers, vacancies were advertised in September and the appointment of two additional dental officers was made but neither of the gentlemen appointed was free to take up his duties until early in 1948.

This establishment of dental officers is quite insufficient to deal adequately with all the children who are found, at the school inspections, to require treatment. Whilst the amount of work necessary to be done, upon the average, for each child with dental defects, because of a fuller appreciation by many parents of the advantages of regular treatment, is declining each year, this relief is offset by the increasing number of parents who are now accepting treatment, perhaps for the first time in the child's school life.

Taking these factors into consideration it is probable that 5,000 children represent the maximum number which each dental officer can undertake to inspect during any year, and an inspection at least once a year is essential if the permanent teeth are to be saved. It will be seen, however, that with a school population of approximately 130,000, the present establishment of 19 dental officers allows only for a proportion of one officer to each 7,000 children. Nevertheless, this number of officers represents the utmost that can be accommodated in existing clinics, and it is impracticable to consider a further increase in the dental staff, greatly as this is needed, until additional premises can be found. Clinics are required urgently in the Tuebrook, Penny Lane and Anfield areas, whilst the large school population in the new estate at Belle Vale presents a problem of its own, but, despite every endeavour, it has not yet been found possible to obtain suitable premises in any of these areas.

33. The review of the work carried out by the dental staff during the year shews a further slight increase in the proportion of permanent teeth it was possible to fill as against those that had to be extracted because of gross decay.

Whilst this is an encouraging step in the right direction, it is quite true to say that no scheme of school dental treatment can be considered to be fulfilling its purpose unless the number of permanent teeth saved

greatly exceeds the number extracted, thus ensuring that children attain the school leaving age in possession, not only of healthy mouths, but also of an adequate number of sound teeth.

This state of affairs can only be brought about by the co-operation with dental officers of parents who are at all times ready to act upon professional advice when it is offered to them, and, in this latter respect, the Service in Liverpool has been much handicapped in the past.

34. Whilst the proportion of parents accepting dental treatment for their children at the time of school inspection has now risen to 68 per cent. there is evidence to shew that this figure by no means entirely represents that percentage of regular yearly participants in the scheme but includes also a considerable number of children for whom the present acceptance has been dictated by toothache and who did not accept treatment in previous, and may not in following, years. This view is borne out by the fact that, whilst the number of parents accepting dental treatment in principle has considerably increased since the service became free of charge, the proportion of children who actually attend the clinics when asked to do so has fallen. The inference is that, the urgency which produced the signature of acceptance having passed and no monetary commitment having been entered upon, some parents no longer feel under any obligation to submit their children for treatment. It is probable that this failure to appreciate that there is a necessity for regularity of treatment, even although it may not manifest itself to the parents, could, at least in part, be alleviated by organised propaganda measures but, until such time as clinic facilities can be made readily available for all school children, it is considered that such measures would hardly be justified. No useful purpose, it is felt, would be served by piling up cases for whom treatment would, because of the lack of facilities, need to be deferred.

35. Much of the work of the school dental officers in the past has been unproductive, their time having had to be spent upon the removal of decayed teeth which, had parental interest been greater, would have been saved by earlier treatment.

Nevertheless, ample evidence exists that many previously apathetic parents are now becoming aware of their duty to take care of their children's teeth, and there is no doubt but that a satisfactory school dental service can, in time, be built up in Liverpool; one which can play an active part in the production of healthier citizens in the future.

To attain this end, the steps necessary to be taken, in order of priority, are: (1) the speedy provision of more clinic premises; (2) the employment of additional dental officers as these premises become available; and (3) the institution of methods of propaganda directed towards the education of parents and children in dental hygiene and the strict necessity for regularity of dental treatment.

ORTHOPAEDIC SCHEME.

36. There were 1,589 children under supervision at the three orthopaedic clinics, 855 of these being new cases, of which number 266 were seen at Walton Clinic, 327 at the Everton Road Clinic, and 262 at the Dingle House Clinic. Altogether the children made 8,763 attendances, either for examination by the surgeon or for massage and exercises.

Summary of Hospital Treatment, 1947.

Correction of deformities of feet or toes	...	...	27
Treatment of torticollis by operation	...	...	7
Osteotomy	...	...	3
Other operations	...	...	7
Other treatment	...	...	3
			—
			47
			—

37. During the year 6 children were provided with artificial legs and 1 child with an artificial arm. In addition, various repairs to artificial limbs were arranged in 10 cases. As repairs to artificial limbs may take several weeks the Committee considering that, not only was it a physical handicap for children to be deprived of their artificial limbs, but that it was also detrimental from the psychological side, accordingly decided to provide each child with a duplicate artificial limb.

38. The Child Welfare Association assisted the parents in obtaining new apparatus, surgically altered boots, repairs, etc., in 1,941 instances, whilst 150 pairs of boots for wearing with apparatus were supplied. The Association likewise assisted the work by supplying cod liver oil and arranging for convalescent treatment, and their visitors also made many visits to parents in the case of 164 children regarding their non-attendance at clinics, and several hundred visits for other reasons connected with the work.

39. The accompanying table shews, in detail, the work carried out at the clinics:—

TABLE 4.
Cases dealt with under the Orthopaedic Scheme during 1947.

40. Mr. J. P. Heron and Mr. R. Roaf were appointed to take over the clinics of which Mr. McFarland was formerly in charge.

41. Mr. Dwyer, another of the orthopaedic surgeons to the clinics, reports that a pleasant feature of the work is the good co-operation of the parents and the voluntary attendances of some parents without having been instructed to attend. One of the difficulties at the present time is the problem of providing adequate footwear for children with orthopaedic defects necessitating special footwear. Mr. Dwyer comments on the happy liaison which exists between the clinics and Alder Hey Hospital, a relationship which it is hoped will continue after July 5th.

Mr. Dwyer concludes his observations by stating: "I feel more strongly than ever that school clinic work run along the present lines plays an important part in preventing deformities occurring whose treatment in later life would involve major operative procedures, and also postural conditions such as kyphosis, flat-feet and knock-knees are caught early and adequately dealt with."

42. Mr. Heron comments on the fact that insufficient sleep is a potent factor in the production of postural deformities and lengthening the process of their correction. He also expresses his satisfaction with the arrangements whereby pre-school children have been included within the scheme. "We are fortunate," he says, "in being able to see the pre-school child and the scholar and being able to follow them as they grow to full maturity—thus providing an orthopaedic service in the very best sense of the word."

43. Mr. Roaf stresses the importance of the scheme whereby defects are treated in their very early stages. He also comments on the difficulty in obtaining suitable footwear and that postural defects appear to be more commonly seen at the city clinics than at clinics in rural areas. "One notices," he says, "how much these children benefit from attending either open-air or special residential schools."

MINOR AILMENTS.

44. At the thirteen minor ailments clinics 32,563 cases were treated during the year. The treatment of these cases necessitated 262,389 attendances which average 8·1 per case treated.

The number of cases of ringworm of the scalp was 48, of which number 39 were treated by X-ray at Belmont Road Hospital under the Committee's scheme and 9 were treated elsewhere. Of the 2,774 cases of skin conditions treated at the minor ailments clinics, 1,959 were cases of impetigo.

There was an increase in the number of cases of conjunctivitis, the number treated being 1,150, whilst 746 children required treatment for blepharitis.

Scabies cases continue to decline from 3,070 in 1945, and 2,052 in 1946, to 1,226 in 1947. All contacts were followed-up, resulting in 279 pre-school children and 256 adults also being treated.

The school medical officers who supervise the work at these scabies clinics carried out 1,286 examinations.

UNCLEANLINESS AND NEGLECT.

45. The school nurses made 386,595 examinations of school children with regard to cleanliness, and altogether 28,190 children were found to show some evidence of verminous infestation or were very dirty. In the case of 1,433 children, statutory notices were served upon the parents owing to their failure to cleanse their children after previous notification, and 988 children were cleansed by the parents and 445 had to be compulsorily cleansed by the staff.

The total number of attendances made at the cleansing stations during the year on account of verminous conditions was 19,400.

At the routine examinations in the schools 7·45 per cent. of the boys and 17·79 per cent. of the girls were found to shew evidence of infestation. The results of the nurses' cleanliness surveys shew that nearly 25 per cent. of the children were found at least once during the year to be infested.

46. The School Attendance Department have co-operated with the School Health Service in investigating cases of neglect referred to them.

Mr. Keenan, the Superintendent of the School Attendance and Care Department, states that:—

"During the year 1947, 33 persons were summoned for the neglect of their children. Proceedings resulted as follows:—Twelve were sentenced to terms of imprisonment varying from one to six months. Five parents were fined in amounts ranging from 20s. to £5. Eight placed on probation, six bound over, one case discharged under the Probation of Offenders Act, and one case dismissed."

47. The problem of uncleanliness amongst school children still takes up a large part of the school nurses' time. As a result of this continuous cleanliness survey, cases of serious verminous infestation are but rarely encountered.

The reason why this unsatisfactory state of personal hygiene cannot be eradicated is because of the constant re-infection to which children are subjected at home from both adults and pre-school children. It is feared that in the circumstances the work of the school nurses in this direction can not be expected to achieve any other result than keeping down the extent of infestation without any material reduction in its incidence.

48. During the year the department, at the request of the Ministry of Health, participated in a joint investigation to ascertain the value of two new insecticides. A full Report on the findings, which first was published in "The Medical Officer" on 20th March, 1948, is reproduced as Appendix "B."

CLOTHING AND FOOTGEAR.

49. The percentages of unsuitable clothing and footgear found amongst the children at the periodic inspections during 1947 are shewn in the following table, together with the percentages for 1946 and 1938, the year preceding the war.

	Boys.			GIRLS.		
	1947	1946	1938	1947	1946	1938
Unsuitable clothing	0·26%	0·78%	0·37%	0·13%	0·24%	0·30%
Unsuitable footgear	0·27%	2·21%	1·42%	0·28%	1·23%	0·92%

It will be seen from this table that the percentages of unsuitable clothing and footgear for 1947 are less than the 1946 figures.

Most of the cases of unsuitable clothing are met with amongst the dirty, malnourished and otherwise neglected children, who shew evidence of late hours and whose parents are of the irresponsible type.

Whilst the overclad child is now a rarity, the school nurses report that many children are found at the inspections to be wearing under-clothing of inferior quality, since woollen garments are almost impossible to obtain at prices which the poorer parents can afford. Some of the boys were found to be wearing worn-out jerseys as vests or shirts, the reason for which was given as a "shortage of coupons." When under-clothing was worn it was too frequently found to be in a bad state of repair and in not too clean a state.

The more careful parents use their clothing coupons wisely and mostly purchase clothing of "utility standard," whilst the less particular deal in second-hand clothing which lasts but a short time.

Footwear, particularly in the case of the boys, is poor, and the wearing of Wellingtons is increasing. The constant wearing of these makes the stockings damp and, as one of the nurses states, they are often "found to hide dirty feet and legs and stockings in need of darning." In some instances the children were found to be wearing Wellingtons without stockings, with the result that the feet were cold and clammy.

Clogs, many of which are ill-fitting, are becoming more popular for summer use. These, when used without stockings, often cause sores. In some schools the children have made their own slippers which they keep at the school for use in school hours.

CHILD GUIDANCE.

50. The Director of the Notre Dame Child Guidance Clinic has submitted the following report on the year's work:—

"During the year ending December 31st, 1947, the number of children attending the Clinic for advice or treatment was 236, a significant increase over last year. Of these, 108 were referred by the Liverpool School Health Service, 24 by School Medical Officers outside the Liverpool area, and 104 by private individuals.

Of the children referred, 226 were of school age, the distribution being as follows:—

Infants	...	...	...	62
Juniors	...	...	...	108
Seniors	...	...	...	56

It will be noticed that the bulk of the children are from the lower age-groups. This is a matter for satisfaction, as indicating that behaviour problems are in many cases being taken in hand early, even before they develop a high nuisance value to parents or teachers, so allowing a much greater likelihood of successful treatment.

The distribution according to intelligence of the children referred, also presents some points of considerable interest. The range was as wide as that shown by last year's report, but there were fewer subnormal children, 10 as compared with 16, a higher percentage of dull and average respectively, and a section of children of very superior intelligence. The following table gives the details of the distribution:—

I.Q.	160 to 169	150 „ 159	140 „ 149	130 „ 139	120 „ 129	110 „ 119	100 „ 109	90 „ 99	80 „ 89	70 „ 79	Under 70	1	2	3	3	13	21	37	46	59	25	21	10·0	subnormal.			
																				

sexual pre-occupation. The Clinic, and the contacts she makes there, represent her one outlet, and though the process of re-education is slow, a healthier outlook is gradually being built up through psychiatric guidance.

(2) X. AGE 7 YEARS 4 MONTHS. I.Q. 111.

This boy belongs to the group graded as above average. He was referred by a Psychiatric Out-patient Clinic as suffering from severe anxiety symptoms, and so exceedingly difficult, stubborn and inaccessible, that it had been found impossible to examine him. At his second visit to the Clinic, much time having been spent at the previous visit in establishing a good contact, psychological tests were given, and he was found to be a boy of very good intelligence, and especially gifted on the practical side. Investigation into the family situation showed that the mother, though very kindly and conscientious, was over-dependent on her husband, and unhappily conscious of her inadequacy and lack of confidence in dealing with X. Individual and Group play-therapy, as well as social work interviews with the mother, were arranged. X progressed well, passing from extreme timidity to a rather boisterous aggressiveness, before he settled down to normal behaviour and ability to mix easily and happily in a group.

A marked stutter has cleared up, and his school work has greatly improved. There has also been considerable improvement in his mother's attitude, and she expresses her appreciation of Child Guidance work. But the success achieved would have been impossible without her co-operation.

(3) T. AGE 8 YEARS 4 MONTHS. I.Q. 128.

This girl, timid and anxious in appearance, was referred for constant enuresis. She proved to have superior ability, masked by her solemn and unresponsive manner. The family history showed that the father had suffered from epilepsy for some years previous to her birth, and that T. had thus spent her babyhood in an atmosphere which, though friendly, was always depressing, and at times terrifying. Then came two severe shocks; an elder sister died very suddenly, and the mother fell ill and was removed to hospital. T.'s whole disposition seemed to change. She grew morose, seldom smiled and never laughed, lost her appetite and became very thin. Weekly psychiatric treatment at the clinic, and

periods of play-therapy were successful in removing some of the gloom which enveloped her. Suggestions in regard to the enuresis and emaciation were faithfully carried out by the mother, and in six weeks improvement was noticeable. In five months, T. reached a point where there was only occasional lapses. She put on weight rapidly, and began to mix well, and to play, and even romp, with enjoyment. When the case was closed, T. left, very well pleased with herself and her "cure," and well able to hold her own in a group, and make use of her superior ability.

(4) J. AGE 6 YEARS 11 MONTHS. I.Q. 89.

This little boy was brought to the Clinic with a history of violent night terrors and attacks of screaming, and of lapses during the day into day-dreams from which it was difficult to rouse him. At school his facial contortions and his wild expression were a source of alarm to the teachers. Visits to the home, arranged by the Psychiatric Social worker, revealed that though the family itself was a friendly and happy one, they were seriously overcrowded, while an uncle, who lived with them, was subject to recurrent epileptic fits. With her husband unemployed, J.'s rather fragile mother was grossly overworked, and in addition was unable to afford the medicine prescribed for her small son. After a few weeks of play therapy and other treatment for J., and help and encouragement for the mother, a marked improvement was noticed. The overcrowding was alleviated by the departure of the invalid uncle and his family to a house of their own. A period in a convalescent home was arranged for the mother. From now on, each week saw a further improvement in J.'s condition and behaviour, both at home and at school. The attacks ceased, and he learned to mix freely with other children. When the case was closed, a happy, confident little boy left saying that he would soon be calling in at the clinic to see his friends."

52. Many children were referred for more than one problem, the following were among the chief treated:—

Difficult behaviour	...	...	...	...	...	...	63
Enuresis and/or Faecal incontinence	...	...	...	...	...	...	42
Pilfering	...	...	...	...	...	...	40
Anxiety and nervous symptoms	...	...	...	...	...	...	35
Backwardness in school subjects	...	...	...	...	...	...	32
Truancy and wandering	...	...	...	...	...	...	20
Speech difficulties	...	...	...	...	...	...	11
Untruthfulness	...	...	...	...	...	...	11
Sex-play	...	...	...	...	...	...	7

Fifteen girls and 35 boys were referred or treated for enuresis during the year under review. This complaint was usually associated with other symptoms, of which anxiety in various forms, and backwardness in school subjects, were the most frequent.

The 184 closed cases are accounted for as follows:—

Adjusted or improved ...	...	...	...	...	...	...	...	...	...	...	72
Attended for diagnosis or advice only	...	...	...	...	...	...	...	...	...	...	48
Admitted or recommended to Residential Schools or Training Centres											19
Closed for lack of co-operation, or withdrawn by parents	...	...									45

TUBERCULOSIS.

53. As a result of examinations made by the school medical officers, 159 school children were referred to the tuberculosis officers for investigation. The Tuberculosis Department also supplied reports upon 1,075 pupils who had been reported from other sources as possible cases of tuberculosis.

54. Dr. J. P. Clarke, the Chief Assistant Tuberculosis Officer, has supplied the following tabulated statistics:—

TABLE 5.

NOTIFICATIONS (LIVERPOOL) OF SCHOOL CHILDREN (5—15 YEARS).

	1925	1930	1935	1939	1940	1941	1942	1943	1944	1945	1946	1947
Pulmonary	559	370	167	72	51	53	54	64	68	60	63	88
Non-Pulmonary	318	256	178	78	67	79	84	107	58	70	72	69
TOTAL ...	877	626	345	150	118	132	138	171	126	130	135	157

Dr. Clarke states that the increase in the number of school children notified during 1947 is probably accounted for by the increased number of examinations of contacts which had been made and the fact that some little time ago, after collaboration with the Liverpool Insurance Committee, all the doctors in the City were issued with a pamphlet dealing

with early diagnosis of tuberculosis and urging them to make use of the facilities at their disposal. As a result of the issue of this pamphlet a marked response was experienced.

MISCELLANEOUS ITEMS.

(a) Infectious Diseases in Schools.

55. There were 4,951 cases of infectious diseases in school children reported to the Public Health Department during the year 1947, this being a decrease of 263 cases as compared with the previous year. Of this total, diphtheria showed the greatest decrease, namely, 155 cases; all the other common infectious diseases shared in the decrease with the exception of mumps, which shewed an increase of 30 cases.

It was not necessary to close any school or department on account of infectious disease during the year.

The arrangements made in previous years for the inoculation against diphtheria of children attending the schools were continued. Visits were paid to 66 primary and modern secondary schools, a total of 5,658 children being inoculated and 754 previously inoculated children received reinforcing injections, while in addition, a number of children of school age were inoculated at the various immunisation clinics held throughout the City.

The proportion of children aged 5—15 years inoculated at the end of 1947 was 72 per cent. The accompanying table is of interest. It shews for a succession of years the number of cases of, and deaths from, diphtheria in children of 5—15 years both amongst inoculated and non-inoculated children as well as the marked reduction in the incidence of cases of diphtheria. This reduced incidence, it will be noted, has been most marked since 1943 when the percentage of immunised children had progressed passed the 50 per cent. figure. If, as is believed, these remarkable figures are attributable to the immunisation scheme it is a great tribute to this aspect of preventive medicine.

Diphtheria Immunisation in Liverpool.

CASES AND DEATHS IN INOCULATED AND NON-INOCULATED CHILDREN IN LIVERPOOL AT AGES 5—15 YEARS.

Year.	No. of Cases.		No. of Deaths.		Total accumulation of inoculated children 5-15 at the end of the year.
	Non-inoculated.	Inoculated.	Non-inoculated.	Inoculated.	
1932	1,852	11	90	—	—
1933	1,658	20	85	1	—
1934	1,622	37	90	—	—
1935	1,526	51	75	3	—
1936	1,218	51	76	1	—
1937	1,382	75	76	2	—
1938	1,270	83	68	2	—
1939	763	53	44	—	—
1940	1,107	49	61	—	—
1941	1,513	74	89	1	51,625
1942	1,328	87	53	—	64,582
1943	623	52	11	—	79,578
1944	375	37	12	1	80,951
1945	358	53	12	—	84,031
1946	241	28	5	—	89,600
1947	167	22	3	1	92,481

(b) Vaccination.

56. Since medical inspection of children was inaugurated in 1909, there has been a progressive decrease in the number of vaccinated children until 1945, but during the last two years there has been an improvement of 6·4 per cent.

The percentage of unvaccinated children amongst the periodic cases examined in 1947 was 24·6.

In 1909 the percentage was	6·1	In 1935 the percentage was	22·7
,, 1915 ,,,	7·1	,, 1940 ,,,	,, 23·4
,, 1920 ,,,	not available.		
,, 1925 ,,,	16·3	In 1945 ,,,	,, 31·0
,, 1930 ,,,	19·1	,, 1946 ,,,	,, 28·8
		,, 1947 ,,,	,, 24·6

(c) Employment of Pupils.

57. During the year a total of 3,307 children (3,172 boys and 135 girls) were engaged in part-time employment. The school medical officers examined 686 children as to their fitness to undertake work before school hours and in 17 cases the undertaking of this part-time work was not recommended on medical grounds.

During the year the Sub-Committee, dealing with the licensing of children, granted 41 theatrical licences.

(d) Children and Young Persons Act.

58. In accordance with the provisions of Section 35 of the Children and Young Persons Act (1933), medical reports, for the information of the Magistrates in the Juvenile Courts at Liverpool and district, were submitted in 2,290 cases.

The Magistrates asked for special medical examinations to be carried out in 159 cases and these were undertaken by the following medical officers:—

Medical Officers to the Remand Homes ...	... ... ...	52
Approved Medical Officers (Ascertainment of Mental Condition) ...		99
Other Medical Officers (Eye Specialists, Orthopaedic Surgeons, Ear Specialists, etc.) ... ... ...	... ... ...	8
		—
		159
		—

(e) School Premises.

59. The City Engineer and Surveyor reports the following alterations and improvements which were carried out on school premises:—

Sanitary improvements ...	... ... ...	2 schools
Playground repairs ...	... ... ...	3 ,,
Improvements and repairs to heating installations, etc. ...	2	,,
New heating boilers ...	... ... ...	7 ,,
Miscellaneous improvements, e.g., classrooms, cloakrooms, windows, floor coverings, etc. ...	... ... ...	9 ,,

NURSERY SCHOOLS AND CLASSES.

60. There are six Nursery Schools with accommodation for 490 children between the ages of 2—5 years and 36 Nursery Classes in 26 schools with a total of 1,076 children between 3 and 5 years old on their rolls.

There is still a shortage of qualified teachers for the Nurseries, but the position as regards the helpers is easing gradually. The scheme for the training of helpers for the National Nursery Certificate is in operation and a number of students have obtained the Certificate.

Nursery education is increasingly popular with parents, who have realised its value to the children. Most of the nurseries have long waiting lists.

Owing to the national economic situation and the state of male unemployment in the city, it has become necessary for more mothers to work, thus creating home circumstances which have produced an increased pressure on the nurseries. A further increase in the number of Nursery Classes in Infants' Departments is impracticable owing to the need for places for children of school age, but the Education Committee has plans for Nursery Schools in new housing areas and it is hoped that as accommodation becomes available, it will be possible to open another Nursery School in Norris Green.

The school medical officers carried out 1,068 medical examinations of these children during the year. A school nurse visits each of the classes several times each week.

The health of the children is generally very good, and the benefit they derive from the nursery regime soon manifests itself.

The types of defects found amongst these children were similar to those found in the case of the older children. The main defects noted were as follows:—

Skin diseases	...	...	...	...	...	41
Minor eye infections	...	...	...	...	...	28
Squint	...	...	...	...	...	79
Otitis media...	...	...	...	...	...	70
Speech defects	...	...	...	...	...	39
Bronchitis	...	...	...	...	...	171
Orthopaedic	...	...	...	...	...	153

All the Committee's treatment schemes were available to these children.

HANDICAPPED PUPILS.

Blind Pupils.

61. This Authority has no special schools for blind pupils and depends upon those conducted by other bodies. At the end of the year under review 26 blind children were accommodated as follows:—

Wavertree School for the Blind	...	...	...	...	8
Roman Catholic School for the Blind, Brunswick Road					6
Sunshine Homes	...	...	...	...	4
Henshaw's School for the Blind	...	...	...	...	4
Worcester College	...	...	...	...	2
Court Grange Special School	...	...	...	...	2
					<hr/>
					26
					<hr/>

Partially Sighted.

62. Classes for partially sighted pupils were held in the following centres:—St. Anne's C.E. School, Christian Street, Grant Road County School, Underlea Day Open-Air School, and Fazakerley Day Open-Air School. The number on the rolls at these classes at the end of the year was 66.

Deaf and Partially Deaf.

63. There were 113 deaf pupils and 45 partially deaf pupils at the end of the year. Of the deaf pupils, 71 were being educated at a day special school, 32 at boarding special schools, and 10 were awaiting admission to special schools. All the partially deaf pupils attended a day special school with the exception of 4 pupils who were at boarding special schools, and 5 pupils awaiting admission.

64. The lip-reading classes started in October, 1946, continued throughout the year. Two classes of 12 children each, one junior and one senior, attend twice weekly for two-hourly sessions. Children selected for this special tuition are from the group of children with defective hearing who, can, nevertheless, profitably remain in their own school, with special assistance (Grade IIa). The cases are selected by the doctors in charge of the aural clinics, and one of these doctors carefully assesses the progress of the children attending the classes.

Using spoken voice tests each child is tested for his ability to lip-read before attending the class and at periods thereafter. Experience shows that, when children attend regularly, six months' tuition enables the majority to lip-read quite well. The benefit to the child in many cases

has been such as to lead the parent to express the opinion "that the child's hearing is now practically normal," whereas the aurist's examination shews little if any alteration in the degree of defect in hearing.

The children who formed the first classes and who finished their course in March were re-examined in October. In most cases the benefits had been fully maintained but a few children were selected for a refresher course.

The teacher in charge of these classes is an experienced teacher of deaf children seconded from the staff of the Crown Street School for the Deaf. The success of the class is largely due to this teacher's enthusiasm and skill.

Epileptics.

65. Two epileptic pupils were attending the Homes for Epileptics, Maghull, and five were at the Colthurst School for Epileptics, Warford, near Alderley Edge, Cheshire.

Delicate Pupils.

66. The 36 places at the disposal of this Authority at the Torpenhow Open-Air School have been fully utilised. There were 75 admissions and the same number of discharges during the year, in all cases the stay being approximately six months. All children upon discharge from Torpenhow are examined and then re-examined from time to time until the child's health is considered normal. During the year the school medical officers gave 29 half-day sessions to this work and as a result of their examinations 30 children were recommended for admission to Day Open-Air Schools.

The number of delicate pupils on the rolls of each of the day open-air schools at the end of the year was as follows:—

Fazakerley Open-Air School	...	...	...	...	202
Underlea Open-Air School	...	...	...	...	132
Margaret Beavan Open-Air School	...	...	...	...	77

A number of crippled children were also in attendance at these schools as shown in paragraph 71.

67. Miss Anderson, the Head of the Fazakerley Open-Air School, expresses the opinion that more of the delicate and physically handi-

capped pupils would benefit by residential provision, basing this opinion on her experience with such children evacuated during the war.

68. Miss Robertson, the Head of the Underlea School, in her report states that the attendance has been very good for this type of school, and she attributes this to the mild winter. Practically one-half of the "delicate" pupils at the school are there because of either chronic bronchitis or asthma, and usually in winter months their attendance is very irregular.

69. Mr. Roberts, the Headmaster of the Margaret Beavan School, describes how the school during the year benefited by a return to the more normal pre-war conditions. The full programme of medical and dental examinations were carried out, there was a full and settled teaching staff, and the "After Care Committee" is "functioning with all its pre-war enthusiasm and efficiency."

70. At the end of the year 107 children were in Hospital Schools, 70 at Alder Hey and 37 at Olive Mount Hospitals.

Physically Handicapped.

71. The physically handicapped pupils in attendance at day special schools, who numbered 334 at the year's end, were being educated at the following five schools:—

Windsor Street	...	...	...	...	...	118
Margaret Beavan	...	...	...	...	...	125
Fazakerley	...	...	...	...	...	30
Underlea	...	...	...	...	...	54
Grant Road	...	...	...	...	...	7
						—
						334
						—

Fifty-two physically handicapped pupils were resident in the Children's Rest School of Recovery at the end of the year.

The accompanying return shews the results of the examinations made by the approved medical officers of children referred with various physical handicaps:—

Recommended for Day Open-Air Schools	231
Recommended for Day Special Schools for the P.H.	70
Recommended for Boarding Schools for the P.H.	110
Recommended for Boarding Special School for Epileptics ...	5
Postponed for further trial in ordinary schools or for treatment...	30
Unsuitable for any school	3
Referred for mental examination	1
To remain in ordinary school	105
	—
	555
	—

Educationally Sub-normal.

72. The Authority has four boarding schools for educationally sub-normal pupils, two for boys, and two for girls, with accommodation as follows:—

Crookhey Hall, near Lancaster, for Senior Boys	70
Hightown School, Hightown, for Boys	57
Dovecot, Knotty Ash, for Girls	40
Colomendy Special School Section for Girls	29

The Hightown School was opened in May, 1947, because of the length of the waiting list for admission to Crookhey Hall. At the end of the year there was a considerable waiting list for both these schools.

Since the end of the year, the educationally sub-normal girls at Colomendy have been transferred to "Oakfield," a new school situated in Gateacre. This school provides for 30 resident and 10 day pupils.

The Authority also maintained 24 educationally sub-normal pupils at other boarding schools, 15 at Pontville Roman Catholic Special School, 7 at the Allerton Priory Roman Catholic Special School, 1 at the Beacon, Lichfield, Staffs, and 1 at Besford Court, Worcestershire.

There are four day special schools and three special classes for educationally sub-normal pupils with accommodation for 590 pupils. The schools are Queensland Street, Northumberland Street, Richmond and Kilrea Road, whilst the classes are at the Banks Road, Grant Road and Fazakerley Open-Air Schools.

73. The results of examinations made by the Approved Officers of children referred for ascertainment as being educationally sub-normal pupils are as follows:—

Recommended for Special Day School	249
Recommended for Special Boarding School	50
Postponed for further trial in Ordinary School or for treatment	76
Recommended for notification to L.M.D.A.	48
To remain in Ordinary Schools	93
	—
	516
	—

Speech Therapy.

74. The Authority was without a Speech Therapist for the greater part of the year as Miss Hopper had left at the end of 1946 and Miss Gledsdale did not take up her duties until October. During the year, 145 children were recommended for speech therapy. Owing to the large number (252) awaiting treatment, only the older children and the most urgent cases amongst the younger children were dealt with.

Medical and Dental Arrangements.

75. The routine medical examinations and the general medical care of the special school children in the special schools outside Liverpool is carried out by local medical practitioners, whilst specialist and dental treatment is provided either under the Local Authorities' arrangements or, in a few instances, by special arrangements made in the areas.

All the medical and dental facilities of the School Health Service are available for the special school children.

Medical treatment under the Authority's schemes was carried out as follows:—

Defective Vision	98
Tonsils and Adenoids	12
Aural conditions	18

whilst children suffering from minor ailments were treated at the schools.

The following shews the work carried out by the dental staff of the School Health Service at the Special and Approved Schools:—

				Speciai Schools.	Approved Schools.
Number of inspection sessions	...	...	...	17	2
Number of treatment sessions	...	...	...	30	10
Total number of sessions	...	...	...	47	12
Number of children inspected	...	...	...	1,183	115
Number of children requiring treatment	...	...	...	699 (59·0%)	66 (57·3%)
Number of children treated	...	...	...	362	66
Number of attendances made for treatment	...	...	...	390	66
Number of teeth extracted	...	...	...	572	26
Number of teeth filled	...	...	...	62	42
Number of other operations	...	...	...	44	20
Number of administrations of general anaesthetics	...			295	20

EMPLOYMENT OF HANDICAPPED PUPILS.

76. The following is extracted from the Report of the Juvenile Employment Service for the year 1947:—

“ Although the general adverse employment position for men and boys has, at times, made it difficult to obtain suitable openings for mentally sub-normal boys, the past year has proved a highly successful period. No fewer than 452 children suffering from some incapacity of mind or body were registered during the twelve months, of whom 129 were educationally sub-normal, while the remaining 323 were handicapped by one of thirty-eight different types of disability, such as paralysis, epilepsy, heart disease, chest complaint, deafness, etc. Not all these children had attended one of the Committee’s Special Schools: many were referred by Almoners and Doctors, by social workers and others who are becoming increasingly aware that special steps are being taken to assist the handicapped to obtain employment within their capacity. The majority, however, have received their education in a Special School, and there is the closest co-operation between the Heads of these schools, the School Medical Officers, and the Vocational Guidance Officer. The normal practice is for the Officer to attend at the time of the final examination when a consultation takes place regarding the most suit-

able type of employment, having regard to the child's disability. Twenty-two such conferences were held during the year, when 79 boys and 37 girls were interviewed. It can be stated without hesitation that the special efforts on behalf of the handicapped are greatly appreciated by the parents, many of whom visit the Bureau to discuss the future of their children. During the year as many as 405 posts were obtained for the handicapped, 252 being filled by boys and 153 by girls, and at the end of the year only 44 handicapped young people were unemployed. Some indication of the complexity of the problem in fitting these boys and girls into jobs within their capacity may be gathered from the fact that the 405 openings were obtained in no less than 98 different kinds of work, the utmost care having to be exercised in the choice of work. In many instances this involves a visit to several employers before an opening can be found in which the conditions of work will not make too heavy a demand upon the physical or mental state of the young person. Careful consideration is also given to the need for vocational training and three boys suffering from spastic paralysis and infantile paralysis have been admitted to the Stanmore Cripples' Training College, and three other boys with various disabilities are awaiting admission to other training establishments. During the year two girls have been provided with artificial hands, while a Grammar School pupil, who was successful in the Open Competitive Examination for the Civil Service and who suffers from a congenital malformation of the right hand, is also being assisted to obtain an artificial hand. Special attention is attached to the post-employment follow-up of handicapped boys and girls. Soon after placement, contact is made with each one either by interview and discussion at the Bureau or by means of a visit to the home. For the purpose of ascertaining how individual boys and girls were progressing, no fewer than 369 home visits were made during the year. Experience shews that in most cases the handicapped and disabled can, when given appropriate vocational advice and when placed in suitable employment, be not only capable of earning their living and making a valuable contribution to the community, but also of leading happy and contented lives. The Sub-Committee are greatly appreciative of the helpful co-operation the Bureau Officers receive from the Medical and Teaching staffs, from Almoners and Personnel Officers, and from the many employers willing to exercise patience in the early stages so that these handicapped young people may be enabled to take their place in the employment field."

Appendix A.**MINISTRY OF EDUCATION.****MEDICAL INSPECTION AND TREATMENT RETURNS, YEAR ENDED 31st DECEMBER, 1947.****TABLE I.****MEDICAL INSPECTIONS OF PUPILS ATTENDING MAINTAINED PRIMARY AND SECONDARY SCHOOLS.****A.—PERIODIC MEDICAL INSPECTIONS.**

NUMBER OF INSPECTIONS IN THE PRESCRIBED GROUPS :—

Entrants	...	...	...	...	...	...	...	...	...	6,222
Second Age Group	...	...	...	...	...	...	...	...	...	15,585
Third Age Group	...	...	...	...	...	...	...	...	...	6,682
<hr/>										
							TOTAL	...	...	28,489

NUMBER OF PERIODIC INSPECTIONS 6,081

GRAND TOTAL 34,570

B.—OTHER INSPECTIONS.

NUMBER OF SPECIAL INSPECTIONS 47,690

NUMBER OF RE-INSPECTIONS 69,142

TOTAL 116,832

C.—PUPILS FOUND TO REQUIRE TREATMENT.

Number of Individual Pupils found at Periodic Medical Inspection to Require Treatment (excluding Dental Diseases and Infestation with Vermin).

Group. (1)	For defective vision (excluding squint). (2)	For any of the other conditions recorded in Table II.A. (3)	Total individual Pupils. (4)
ENTRANTS	29	1,143	1,160
SECOND AGE GROUP	1,392	2,350	3,345
THIRD AGE GROUP	950	757	1,304
TOTAL (PRESCRIBED GROUPS) ...	2,371	4,250	5,809
OTHER PERIODIC INSPECTIONS ...	361	992	1,250
GRAND TOTAL	2,732	5,242	7,059

TABLE II.

A.—Return of Defects found by Medical Inspection in the Year ended 31st December,
1947.

Defect Code No.	DEFECT OR DISEASE.	PERIODIC INSPECTIONS.		SPECIAL INSPECTIONS.	
		Number of Defects.		Number of Defects.	
		Requiring Treatment.	Requiring to be kept under observa- tion, but not requiring Treatment.	Requiring Treatment.	Requiring to be kept under observa- tion, but not requiring Treatment.
(1)	(2)	(3)	(4)	(5)	
4	Skin	245	215	4,370	36
5	Eyes—(a) Vision	2,732	866	936	139
	(b) Squint	1,304	261	507	51
	(e) Other	185	217	3,661	61
6	Ears—(a) Hearing	100	163	82	72
	(b) Otitis Media ...	227	266	1,225	41
	(e) Other	129	284	2,198	61
7	Nose or Throat	807	2,915	408	351
8	Speech	64	278	45	98
9	Cervical Glands	55	943	16	78
10	Heart and Circulation ...	2	1,105	—	204
11	Lungs	320	1,158	151	165
12	Developmental—(a) Hernia ...	48	135	1	7
	(b) Other ...	114	484	1	12
13	Orthopaedic—(a) Posture ...	213	428	14	38
	(b) Flat Foot ...	464	673	66	59
	(c) Other ...	214	417	47	74
14	Nervous System—(a) Epilepsy	2	45	25	25
	(b) Other ...	69	485	89	148
15	Psychological—				
	(a) Development ...	185	404	139	160
	(b) Stability ...	59	175	22	52
16	Other	1,440	3,108	24,226	967

B i.—Classification of the General Condition of Pupils Inspected during the Year in the Age Groups.

(From 25/2/47 to 31/12/47)

Age Groups. (1)	Number of Pupils In- spect ed. (2)	A. (Good).		B. (Fair).		C. (Poor).	
		No. (3)	% of col. 2 (4)	No. (5)	% of col. 2 (6)	No. (7)	% of col. 2 (8)
Entrants	5,045	3,590	71·16	1,379	27·33	76	1·51
Second Age Group... ...	10,959	8,266	75·43	2,567	23·42	126	1·15
Third Age Group	3,320	2,782	83·80	497	14·97	41	1·23
Other Periodic Inspections	4,709	3,291	69·89	1,361	28·90	57	1·21
TOTAL ...	24,033	17,929	74·6	5,804	24·15	300	1·25

B ii.—Under Old Classification

(From 1/1/47 to 24/2/47)

Age Groups.	Number of Pupils In- spect ed.	A. Excellent.		B. Normal.		C. Slightly Sub-normal.		D. Bad.	
		No.	%	No.	%	No.	%	No.	%
Entrants	1,177	122	10·37	1,039	88·27	16	1·36	Nil.	Nil.
Second Age Group... ...	4,626	274	5·92	4,300	92·96	51	1·10	1	0·2
Third Age Group	3,362	561	16·69	2,789	82·95	12	·36	Nil.	Nil.
Other Periodic Inspections ...	1,372	113	8·24	1,243	90·59	16	1·17	Nil.	Nil.
TOTAL ...	10,537	1,070	10·15	9,371	88·94	95	·90	1	·01

TABLE III.

TREATMENT TABLES.

Group I.—Minor Ailments (excluding Uncleanliness, for which see Table V).
 (Year ended 31st December, 1947).

							Number of Defects treated, or under treatment during the year.
(a)							
SKIN—							
Ringworm—Scalp—							
(i) X-Ray treatment.	If none, indicate by dash						39
(ii) Other treatment	...	...	...	...	...	...	9
Ringworm—Body	...	...	...	...	...	...	198
Seabies	...	...	...	...	...	...	1,226
Impetigo	...	...	...	...	...	...	2,045
Other skin diseases	...	...	...	...	...	...	848
EYE DISEASE—							
(External and other, but excluding errors of refraction, squint and cases admitted to hospital)							3,554
EAR DEFECTS—							
(Treatment for serious diseases of the ear (e.g., operative treatment in hospital) should not be recorded here but in the body of the School Medical Officer's Annual Report)							3,296
MISCELLANEOUS—							
(e.g., minor injuries, bruises, sores, chilblains, etc.)							23,502
							TOTAL
							34,717
(b) Total number of attendances at Authority's minor ailments clinics							262,389

Group II.—Defective Vision and Squint (excluding Eye Disease treated as Minor Ailments—Group I).

	No. of Defects dealt with.
ERRORS OF REFRACTION (including squint)	8,602
(Operations for squint should be recorded separately in the body of the School Medical Officer's Report)	
Other defect or disease of the eyes (excluding those recorded in Group I) ...	8
TOTAL ...	8,610
Number of Pupils for whom spectacles were (a) Prescribed	6,144
(b) Obtained	6,042

Group III.—Treatment of Defects of Nose and Throat.

	Total Number Treated.
Received Operative Treatment—	
(a) For Adenoids and Chronic Tonsillitis	428
(b) For other Nose and Throat conditions...	—
Received other forms of treatment	—
TOTAL ...	428

Group IV.—Orthopaedic and Postural Defects.

(a) Number treated as In-patients in hospitals or hospital schools	320
(b) Number treated otherwise, e.g., in clinics or Out-patient departments ...	1,589

Group V.—Child Guidance Treatment and Speech Therapy.

Number of pupils treated (a) under Child Guidance arrangements ...	105
(b) under Speech Therapy arrangements ...	55

TABLE IV.

Dental Inspection and Treatment.

TABLE V.

Infestation with Vermin.

(Year ended 31st December, 1947)

(1) Total number of examinations in the schools by the school nurses or other authorized persons	...	...	...	...	...	...	386,595
(2) Total number of individual pupils found to be infested	...	...	...	...	...	...	28,190
(3) Number of individual pupils in respect of whom cleansing notices were issued (Liverpool Corporation Act, 1921)	...	...	...	...	...	...	1,433
(4) Number of individual pupils in respect of whom cleansing orders were issued (Liverpool Corporation Act, 1926)	...	...	...	...	...	...	445

TABLE VI.

School Medical and Dental Staff.

NAMES OF MEDICAL OFFICERS.	Proportion of whole-time (expressed as a percentage) devoted to	
	School Health Service	Public Health
School Medical Officer— Dr. W. M. Frazer (also Medical Officer of Health) ...	Not assessable	Whole- time
Chief Assistant School Medical Officer— Dr. R. Gamlin	100%	Nil.
Senior Assistant School Medical Officer— Dr. G. S. Robertson	„	„
Assistant School Medical Officers—		
Dr. Muriel C. Andrews	„	„
Dr. A. M. Brown	„	„
Dr. A. T. Burn	„	„
Dr. D. J. Doherty	„	„
Dr. Marjorie M. Fleming	„	„
Dr. M. Godwin	„	„
Dr. S. Howard	„	„
Dr. F. P. Irvine	„	„
Dr. B. S. Jarvis	„	„
Dr. A. R. Kennedy	„	„
Dr. Mary F. Lacey	„	„
Dr. Grace E. McConkey	„	„
Dr. Mary Pilling	„	„
Dr. Flora S. Quin	„	„
Dr. G. R. Thorpe	„	„
Dr. Elizabeth P. Duncan	3 sessions per week	„

TABLE VI—*Continued.*

NAMES OF DENTAL OFFICERS.	Proportion of whole-time (expressed as a percentage) devoted to						
	School Health Service	Public Health					
Senior Dental Officer— Mr. T. H. Parsons	100%						
Assistant Dental Officers— Mr. A. Brewer	"						
Mr. E. Crosbie	"						
Mr. A. P. Finlay	"						
Mr. L. A. Jones	"						
Mr. F. C. Littleton	"						
Mr. J. W. Martin	"						
Mr. G. E. Nevins	"						
Miss C. C. Sloan	"						
Mr. J. Tyson	"						
Mr. L. C. Winstanley	"						
Mr. J. A. Wood	"						
Mr. W. F. Wren	"						
[NOTE.—This does not include 1 Dentist who had not been released from the Forces by the end of the year.]							
Mr. J. A. Bell Mr. J. P. Blacoe Mr. H. W. Martin } Temporary part-time....	(per week) 6 sessions 5 ,," 5 ,,"						

Nurses.	Number of Officers.	Aggregate of time given to School Health Service work in terms of whole-time Officers.
School Nurses	65	65
District Nurses	Nil.	Nil.
*Nursing Assistants ...	3	3
Dental Attendants ...	8	8

* This term refers to the untrained assistants described in paragraph 3 of Circular 1604.

Appendix B.

Reprinted from THE MEDICAL OFFICER, 20th March, 1948.

EXPERIMENTS WITH DDT AND GAMMA B.H.C. ("Gammexane") FOR USE AGAINST HEAD LICE.

J. R. BUSVINE, B.Sc., Ph.D.

Entomology Department, London School of Hygiene and Tropical Medicine.

J. L. BURN, M.B., D.Hy., D.P.H.
Medical Officer of Health, Salford.

R. GAMLIN, M.A., M.B., B.Ch., M.Hy., D.P.H.
Chief Assistant School Medical Officer, Liverpool.

INTRODUCTION.

LETHANE HAIR OIL N.W.F. (1) has been used for several years for treating head lice and has usually given satisfactory results (see Ministry of Health "Memorandum on Control of Head Lice: 230A.Med./"). Nevertheless this preparation has certain disadvantages, e.g. (a) Almost all insecticidal value is lost after the hair has been washed; (b) some patients object to the oily nature of the treatment and a few experience a temporary stinging of the scalp after treatment; (c) the insecticide has to be imported from U.S.A. at the expense of valuable dollars. It was deemed advisable to examine two new synthetic insecticides as alternatives to "Lethane" and this paper describes three independent investigations on the subject. This work was initiated by the Ministry of Health whose approval of the publication of these results was secured.

In view of the unknown toxicity hazard which might accrue from repeated applications of oily solutions of the new insecticides, most of the work was concentrated upon aqueous preparations.

SECTION I.

LABORATORY TESTS. (Conducted by J.R.B.).

METHODS.

In all the following tests the preparations were diluted with water to the desired concentration and applied to the hair of male colleagues

at the rate of 8 c.c. per head. This amount was usually sufficient to wet all the hair without excess of liquid. After certain intervals, samples of the hair were clipped from the treated heads and put into feeding tins with 10-12 lice, whose mortality was subsequently observed two or three days later. The percentages given in the following tables are estimated from results with at least three individuals.

2. RESULTS OF TESTS.

(i) Emulsions of DDT.

Published data (2) showed that emulsions containing 2 per cent. of DDT were highly effective. Unfortunately it was found in preliminary tests that the DDT was largely removed from the hair by washing. This was disappointing in view of the persistence of DDT on underwear (impregnations against body lice) which resisted several launderings. It was considered possible that if a suitable type of emulsion could be found the DDT might be deposited more firmly on the hair.

The following emulsion concentrates were prepared by Dr. J. A. Mitchell, of D.S.I.R., Chemical Laboratory, Teddington :—

E1 = 5 per cent. DDT/Lanoline/Solvent Naphtha/"Fixonol C."

E2 = 7.5 per cent. DDT/Lanoline/Solvent Naphtha/Sodium oleate/
"Teepol X."

E3 = 15 per cent. DDT/Solvent Naphtha/Sodium oleate/"Teepol X."

E4 = 18 per cent. DDT/Solvent Naphtha/"Fixonol C."

(Lanoline was present in Nos. 1 and 2, absent in 3 and 4. Nos. 1 and 4 had cationic emulsifiers and Nos. 2 and 3 had anionic emulsifiers.)*

These preparations were diluted to contain 2 per cent. DDT and applied to different individuals. Clippings after one week gave the results shown, viz. :—

	<i>Percentage Kill of Lice.</i>	
	<i>Hair Washed.</i>	<i>Hair Not Washed.</i>
E1	...	25
E2	...	25
E3	...	42
E4	...	30

* "Fixonol C" (cetyl or oleyl pyridinium bromide) is a cationic emulsifier because the long lipophilic hydrocarbon chain is attached to the cationic part of the molecule; whereas sodium oleate and "Teepol X" (sodium secondary alkyl sulphates of chain length C₁₀ to C₁₈) are anionic emulsifiers, for analogous reasons.

Three individuals treated with 2 per cent. DDT in E4 were clipped after two weeks without a hair wash. The clippings gave 80, 66 and 43 per cent. kill respectively.

From these results it appears that none of the formulæ were outstandingly successful in protecting the DDT against removal by washing.

As an alternative method, emulsions were prepared which contained coumarone resin (3) to stick the DDT crystals to the hair. The following were made up by Dr. L. R. Hart, of C.D.E.S. (Ministry of Supply), Porton :—

ATSO No. 2 = 18 per cent. DDT/Solvent Naphtha/"Fixonol C"
(used for impregnating shirts).

E5 = ATSO No. 2/n-Butyl alcohol/8 per cent. coumarone resin.

E6 = ATSO No. 2.Sextol/8 per cent. coumarone resin.

Applied at 2 per cent. DDT these gave the following results, clipped one week later, after washing :—

<i>Emulsion.</i>	<i>Percentage Kill of Lice.</i>		
E5	93		
E6	100		
E3	43		

It is evident that the presence of coumarone resin decreases the loss of DDT in washing. Unfortunately this substance tends to matt the hair together for several days after application which is a serious disadvantage in applications to human hair.

(ii) Dispersions of Various Insecticides.

An aqueous dispersion of DDT or another insecticide (i.e. a suspension of *solid* particles in water) would, if effective, have several advantages over an emulsion. The absence of solvent eliminates all risk of toxicity by absorption through the skin (4) and also the unpleasant smells of certain solvents.

As a preliminary, a disperson was prepared by mixing one part of 20 per cent. DDT in acetone with three parts of ethyl alcohol and then adding to six parts of water. This formed a disperson sufficiently stable to allow application in the laboratory. It was tested in comparison with "Guesapon" DDT emulsion both at the rate of 2 per cent. DDT.

Experiments were done by the same methods as in section (i) and the average kills of lice by hair clipped from different heads were found to be as follows:—

	<i>Percentage Kills of Lice by Hair Clipped after:—</i>		
	5-7 <i>Days.</i>	8-11 <i>Days.</i>	11-15 <i>Days.</i>
2 per cent. DDT Dispersion ...	100	75	44
2 per cent. DDT Emulsion ...	100	61	39

From these experiments it seems clear that a dispersion is at least as effective as an emulsion as a method of applying DDT.

Further experiments were made with the following dispersions:—

- (a) Several formulæ suggested by Mr. A. W. Thompson, containing DDT, Cellofas, Kaolin and sometimes Lysol.
- (b) Several formulæ prepared by Dr. A. B. P. Page, of Imperial College of Science, containing either DDT or *Gamma* B.H.C. with Kaolin, "Teepol" and sometimes pyrethrins.

N.B.—"Cellofas" is a gelatinous material used to keep DDT in suspension. "*Gamma* B.H.C." is the *gamma* isomer of benzene hexachloride. "Teepol" is a surface active wetting agent, marketed by Messrs. Technical Products Ltd.

The following average kills were taken from results with small groups (3-8) of test subjects:—

<i>Formula (Percentage in Water).</i>	<i>Percentage Kill of Lice by Hair One Week Later. Head Washed. Not Washed.</i>
2 per cent. DDT ...	... } 80
1 per cent. Cellofas }
2·5 per cent. Kaolin }
2 per cent. DDT }
1 per cent. Cellofas }
1 per cent. Lysol }
2·5 per cent. Kaolin }
2 per cent. DDT }
4 per cent. Kaolin }
1 per cent. "Teepol" }
1 per cent. <i>Gamma</i> B.H.C. }
2 per cent. Kaolin ...	100 }
0·5 per cent. "Teepol" }
0·5 per cent. <i>Gamma</i> B.H.C. }
1 per cent. Kaolin ...	100 }
0·25 per cent. "Teepol" }
0·25 per cent. <i>Gamma</i> B.H.C. }
0·5 per cent. Kaolin ...	100 }
0·5 per cent. "Teepol" ...	70 }

From these results DDT at 2 per cent. seems to be moderately effective: addition of cellofas or lysol does not significantly affect the result. Cellofas has the unpleasant effect of leaving a scaly white deposit in the hair.

Gamma B.H.C. seems to be distinctly more efficient than DDT in these preliminary tests; this agrees with spraying experiments (5) which indicate a toxicity to lice twenty times as great as that of DDT.

It has been reported that DDT is very slow in action and that this might be a serious disadvantage in a head-louse preparation in certain circumstances. Accordingly, the speeds of kill of the various substances were determined. The times for paralysis of lice were found to be as follows:—

<i>Insecticide Type.</i>	<i>Time before Paralysis.</i>
DDT ... ...	... Over 3 hours.
DDT + cellofas	Over 3 hours.
DDT + cellofas + 2 per cent. Lysol	(Approx.) $\frac{3}{4}$ hour.
<i>Gamma</i> B.H.C.	(Approx.) $\frac{1}{2}$ hour.
DDT + 0·1 per cent. pyrethrins ...	Less than 5 minutes.

The most rapid "knockdown" was brought about by pyrethrins. Even at a tenth of the strength used (i.e. at 0·01 per cent. pyrethrins) the lice were paralysed in about 15 minutes.

3. REFERENCES.

- (1) Busvine, J. R., and Buxton, P. A. (1942): *Brit. Med. J.* (i), 464.
- (2) Scobbie, E. B. S. (1945): *Ibid* (i) 409.
- (3) West, T. F., and Campbell, G. A. (1946): "DDT," Chapman & Hall Ltd., London, 301 pp., 21s.
- (4) Cameron, G. R., and Burgess, F. (1945): *Brit. Med. J.* (i), 865.
- (5) Busvine, J. R. (1946): *Ann. Appl. Biol.*, 33, 271.

4. CLINICAL TRIALS.

These results were briefly communicated to the manufacturers of DDT and *Gamma* B.H.C. and they were invited to prepare dispersions of the types found satisfactory in laboratory tests, for more extensive trials. The following were eventually produced:—

(a) *DDT* (The Geigy Co., Ltd.).

- (i) A dispersable powder containing 33 per cent. DDT.
- (ii) A pyrethrum preparation containing $12\frac{1}{2}$ per cent. pyrethrins
300 gm. of (i) is made up into thin cream with water and 40 gm.
of (ii) added with stirring. The whole is made up to 5 litres
and then contains 2 per cent. DDT and 0·1 per cent. pyrethrins.

(b) *Gamma B.H.C.* (Imperial Chemical Industries Ltd.).

An ethanol solution containing 1 per cent. *Gamma B.H.C.* together
with dispersing agents. This is poured into four times its
volume of water and gives an immediate suspension, containing
0·2 per cent. "Gammexane."

(c) *Gamina B.H.C.* (Imperial Chemical Industries Ltd.).

A lotion consisting of 0·2 per cent. "Gammexane" in :—

Castor Oil	...	...	...	10	parts.
Waxoline Yellow A.D.S.	...			0·001	,
Oil of Lavender Spike	...			0·4	,
Ethanol Indust	...	...		Up to 100	,

SECTION II.

TRIALS IN SALFORD. (Supervised by J. L. B.)

1. METHODS.

Each infested child was examined carefully and a note taken of the number of live lice seen. Nits were recorded as, X for few, XX for many, and XXX for numerous. Each head was treated with 10 c.c. of the preparation, the hair being parted repeatedly, each time a quantity of the insecticide was applied by means of a pipette and spread by rubbing with the fingers.

On the second day each head was inspected but not combed, and any infestation reported. The seventh day after treatment the heads were again thoroughly examined for lice, and in addition the left side was combed with a *bone* scurf comb, and the combings inspected under a magnifying glass. Fourteen days after treatment the investigation concluded with a thorough examination of the head and a combing of the right side of the hair with a similar inspection of combings. The results of all inspections were recorded.

The bone comb was used in order to avoid removing nits, and therefore to test to the maximum the residual toxicity of the insecticide with newly hatched nits. All the children were instructed not to wash their heads, but those cases which did wash were taken to a conclusion. There was no follow-up of family contacts.

Further to this general plan, the cases were divided into three groups treated in slightly different ways. Group "A" was examined on the second day without combing. Group "B" had a part of the head combed with a bone scurf comb, and the combings examined under the magnifying glass. Group "C" in addition to the combing as for Group "B" had another 10 c.c. applied.

2. RESULTS.

(a) 2 per cent. DDT Dispersable Powder (plus 0·1 per cent. Pyrethrins).

Each child was treated with 10 c.c. of this preparation and the results were recorded in the three groups mentioned.

All children were told not to wash the hair during the two weeks of the investigation, and those who were found to have disregarded this were rejected for the purposes of this experiment. Also all children who had had an insecticide applied in the previous two weeks were not employed as subjects.

A total of fifty cases were treated and at the end of the investigation forty-six (92 per cent.) were free from infestation, and four had live lice or larvae (2 group "A" and 2 group "B").

(b) 0·2 per cent. Gamma B.H.C. Dispersion in Water. (All tested in Group "A.")

(i) Dispersion prepared by tap water.

The number of children treated was 15, of whom 11 obeyed the instructions not to wash the hair (although 3 more visited the swimming baths). After seven days one child had a live louse in his hair. At the end of the fourteenth day the heads of four children contained live lice or larvae. One of these children had washed her hair and one had visited the baths during the fourteen days.

(ii) *Dispersion prepared with distilled water.*

It was found that very much better and more persistent dispersions were obtained if distilled water was used for diluting the spirit stock solution instead of tap water. The following treatments were made with this improved dispersion.

Thirteen children were treated with this preparation. Only 2 of them obeyed the instructions not to wash the hair. Three children washed during the first week and 10 during the second. At the completion of the fourteen days all the 13 heads were found to be clear, nor had any live lice or larvae been discovered on the seventh day.

(c) 0·2 per cent. Gamma B.H.C. in Castor Oil/Ethanol Lotion.

A total of 198 children were treated with this preparation, of whom 119 obeyed the instructions not to wash the hair. Among these 119, only one case was found to contain a live louse, this being on the fourteenth day. This fully-grown insect was removed in order to discover if the preparation was in the process of killing it. Although two opportunities of fifteen minutes each were given for the louse to feed on an arm it made no effort to do so. It was quite active but showed a marked desire to turn on its back. The following morning, eighteen hours after removal, it was dead. It seems possible that this louse may have been a recent infestation from an outside source.

Among the 79 children who washed their hair (some of them twice) there were 7 cases having live lice and/or larvae at the completion of the investigation.

3. REMARKS ON THE PREPARATIONS USED.

"Gammexane."

No reactions to either of the preparations were observed either on the hands of the disinfectors or on the heads of the cases. Children with large sore impetiginous areas were not treated, but those with small areas were included in the investigations.

Both these preparations are easy to apply and acceptable to the children treated. Neither leave the hair unsightly as is common with Lethane, though the castor oil preparation does impart a slight greasy finish.

DDT.

Difficulty was experienced in making a uniform suspension--there is a sediment formed soon after the most vigorous shaking, and this fact alone makes its use in the School Health Service undesirable. No reactions to the insecticide by the hands of the disinfectors or by the heads of the children treated were reported.

SECTION III.

TRIALS AT LIVERPOOL. (Supervised by R. G.)

1. METHODS.

The methods employed were substantially the same as described in Section II. The quantity of insecticide applied was, however, varied according to the amount of hair from about 2 to 6 drams (7 to 21 c.c.).

2. RESULTS.

(a) 2 per cent. DDT Dispersion plus 0·1 per cent. Pyrethrins.

Though over 100 cases were investigated, a number of them which had not complied with all the conditions were ruled out, leaving a total of 87 cases which had fulfilled all the required conditions.

At the end of twenty-four hours 23 per cent. of the cases were found to be still infested with either lice or their larvæ, and at the end of the first week the same percentage was found to be still infested though the infestation was largely by larvæ. At the end of two weeks the percentage had increased to 37 per cent., and more adult lice were found than were present the week previously.

It would appear, therefore, that DDT is lethal to adult lice, though it may take twenty-four hours or longer to kill all lice. Its action does not appear to be persistent, or lethal to nits.

(b) 0·2 per cent. Gamma B.H.C. Dispersion in Water.

In Series X which comprised 47 cases, the following procedure was adopted:—

- (i) From 2-6 drams of solution, depending upon the quantity of hair, was rubbed on to the scalp.
- (ii) After ten days the hair was well combed with a fine-toothed comb and the combings carefully examined for lice or larvæ.

- (iii) After this combing, half the original quantity of solution was applied to the scalp.
- (iv) In a further ten days' time the head was re-examined for lice or larvae.

Findings.

On examination after ten days three children were still found to have live lice and one of these was still infested on the 20th day, whilst one not found infested on the 10th day was discovered to be so on the 20th day. It might be mentioned that all these four cases were heavily infested at the commencement of the experiment.

As already mentioned, the amounts of lotion used varied between 2-6 drams on the first application and 1-3 drams on the second. As it was thought possible that the reason for finding infested cases might be due to the amount of lotion applied being inadequate, in the Series Y experiments 4-6 drams were used.

In Series Y, which composed 82 cases, only one application of the solution was given, the procedure being on the first day to rub on to the scalp 4-6 drams of the solution, to comb and examine the combings after ten days and again after twenty days.

Findings.

In two cases one louse was found on the 10th day whilst seven others were found infested on the 20th day.

Though lice in a few cases were found on the 10th or 20th day after treatment, in no case in either series of experiments were larvae ever found. It may, therefore, be inferred :—

- (a) That the "Gammexane" had proved inimical to nit hatching, and
- (b) That the adult lice found on the 10th and 20th days were possibly the result of re-infestation in the home.

Inquiries from the nurses undertaking the experiment tend to corroborate inference (b) since they were known to be very dirty homes.

In order to eliminate this possible complication of home re-infestation it was decided to carry out a third series of experiments.

In Series Z, 17 infested children instead of being cleansed before departure to a camp school were allowed to go in an infested state. Immediately upon arrival they were all treated with 6 drams of the "Gammexane" dispersion, and a further 3 drams was applied on the 10th day. On the inspections on the 10th and 20th days all were found to be free from lice.

3. REMARKS ON THE PREPARATIONS USED.

DDT.

After application of the DDT-pyrethrin dispersion it was found that any time from three to thirty minutes was required for the lice to become paralysed. During this time, they tended to come to the surface of the hair, lose their grip and fall off.

None of the patients complained of any pain or tingling and no sign of skin irritation was observed on their heads or on the nurses' hands.
"Gammexane."

In about ten out of all the cases treated the children complained of some itching but there were no visible signs of dermatitis.

SUMMARY AND CONCLUSIONS.

Laboratory Tests.

1. Judging from samples of hair clipped from heads treated with them a week previously, a variety of emulsions and dispersions, all containing DDT, appeared to be about equally good for killing head lice.
2. Preparations containing 0·2 per cent. *Gamma* B.H.C. ("Gammexane") were as good as or rather better than 2 per cent. DDT.
3. Most of the treatments lost much of their effectiveness when the treated head was washed.
4. DDT preparations were slow in paralysing lice. This defect can be remedied by the addition of 0·1 per cent. pyrethrins.

Clinical Trials.

1. Infested school children were treated with the following preparations and kept under observation for two or three weeks:—
 - (a) 2 per cent. DDT plus 0·1 per cent. pyrethrins (aqueous dispersion).

(b) 0·2 per cent. *Gamma* B.H.C. ("Gammexane") (aqueous dispersion).

(c) 0·2 per cent. *Gamma* B.H.C. ("Gammexane") (oil-spirit solution).

2. Combining all data (including some Salford cases where the hair was washed after treatment) the results can be summarised as follows:—

Series	Treatment	No. Treated	FAILURES AFTER	
			1 Week	2-3 Weeks
(Salford)	(a) DDT	50	?	4 (8 %)
	(b) <i>Gamma</i> B.H.C. (disper.)	28	1	4 (14 %)
	(c) " " (sol.) ...	198	0	.7 (3·5 %)
(Liverpool)	(a) DDT	87	20	32 (37 %)
	(b) <i>Gamma</i> B.H.C. (disper.)	146	4	9 (6 %)

Comments.

Apart from the relatively small numbers of cases treated with the aqueous preparation (b) at Salford, the results obtained with the *Gamma* B.H.C. are better than those observed with DDT. The number of failures with DDT at Liverpool was surprisingly high. It is possible that to some extent the DDT is handicapped by the speed with which the dispersed particles tend to settle to the bottom after shaking.

3. In general, the clinical tests showed the new synthetic materials to be at least as good as Lethane hair oil has been found in practice. Moreover, they have a superior cosmetic appearance, which leads to fewer complaints from parents. There seemed to be some evidence that washing did not entirely neutralise the insecticidal properties of the "Gammexane."

Acknowledgments.

The work of examination and treatment in the clinical tests was conducted by various selected health visitors and technicians, all of whom had received special tuition in standardised methods for the purposes of the experiments. We are indebted to these people for their careful and conscientious labours.

Appendix C.

ANALYSIS OF 1947 WEIGHTS AND HEIGHTS OF CHILDREN IN THE CITY OF LIVERPOOL.

1. Introduction.

Early in April, 1948, we were invited by the School Medical Officer of the School Health Service of the City of Liverpool to review certain statistical information which had been collected by his department. He was somewhat perturbed by a drop in average weight and height of the children in a particular group of Liverpool schools which had been examined yearly; this drop started in 1945 and continued in 1946 and 1947. At the same time he invited us to investigate the statistics which had been collected in earlier years.

Due to the extensive nature of the data collected in any one year it was decided to make a preliminary analysis of that collected in 1947. For this year, information was supplied for children of ages 12, 8 and 5. The information relating to children in the age group 12 did not cover those attending grammar schools and, therefore, did not constitute a fair sample. It was also felt that the information relating to children of age 5 was not likely to be representative in view of the fact that many children do not start school precisely at this age. Attention was therefore centred on those of age 8. It was found on enquiry, that all children whose ages, when weighed and measured, varied from 8 years 0 days to 8 years 361 days, were classed as being in the age group 8; the evidence therefore should properly be associated with children of age $8\frac{1}{2}$ years. For the last few years these weights were taken in the month of September by a team of nurses who visited the various schools in turn, but prior to 1944 the measurements were made at varying times of year. The time available did not allow us to consider boys and girls separately; so that the analysis was further restricted to deal with boys in the age group 8. In 1947, the nurses measured heights and weights of 1,099 boys in 10 sessions each of $2\frac{1}{2}$ hours, roughly 5 days altogether; the boys wore trousers and shirts, but no shoes or socks. It was decided, for the sake of a preliminary analysis, to deal only with the weights.

The information obtained from the office of the School Health Service was then classified according to the school, and was grouped under the

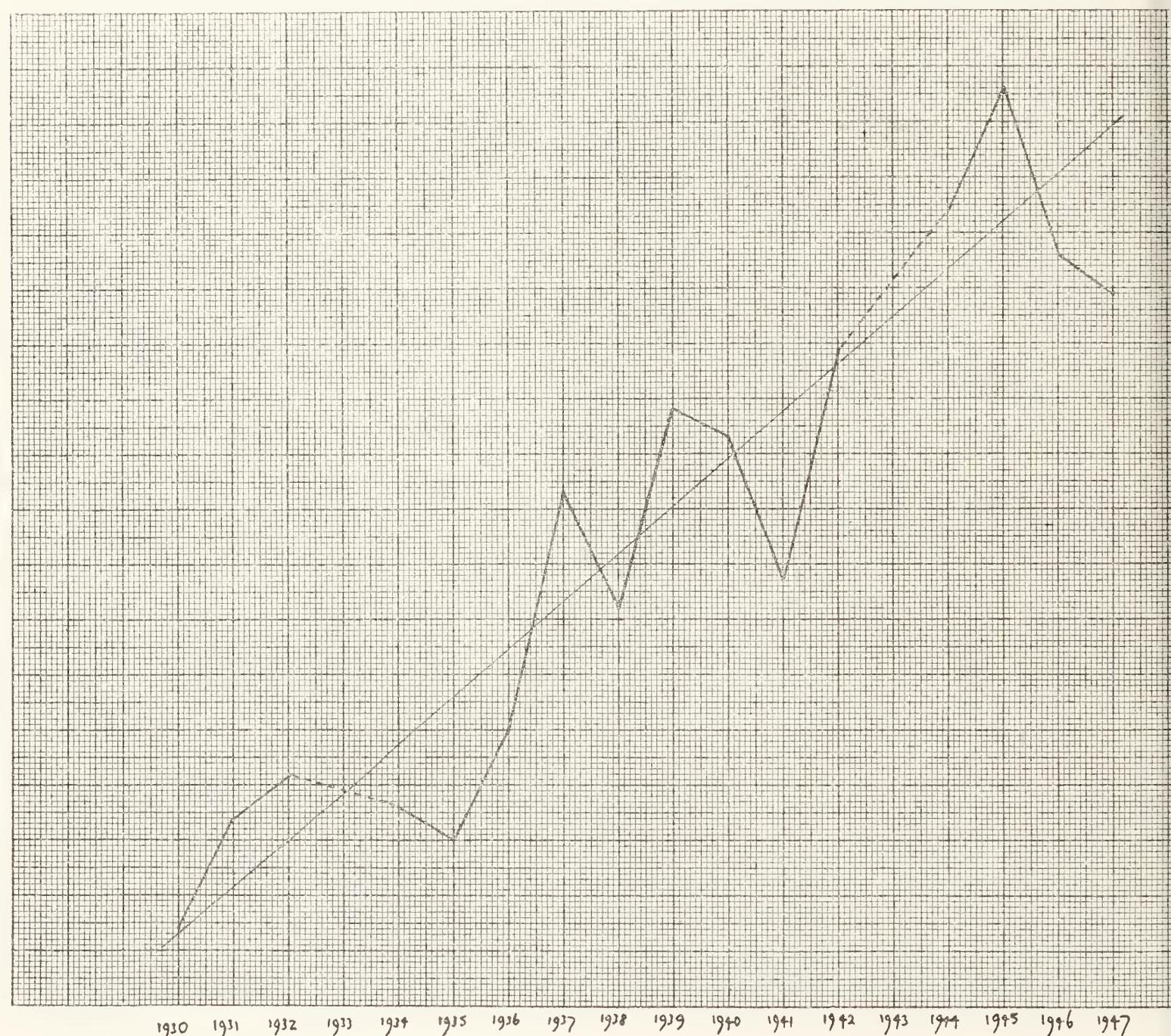
headings of Good, Fair and Poor. Roughly speaking, the children in Good schools are those of black-coated workers, in Fair those of artisans, in Poor those of labourers and from dock-side areas.

The figures given in this analysis are in kilograms. To convert to pounds the figures should be multiplied by 2.2046.

2. Analysis.

To determine whether there has been a significant drop in weight from the means of the war years, the means for each year from 1930 to 1947 inclusive were plotted in the accompanying graph (apart from 1933 and 1943, where there was no information). The graph, while varying considerably, exhibits a roughly linear increasing trend over this period. A straight line was fitted to the points from 1930 to 1946 inclusive and

MEAN WEIGHTS OF BOYS AGED 8



extended to 1947. It appeared that the predicted value for that year was 25.20 Kg. with a standard error of 0.09 Kg. Thus the difference between observed and predicted values for 1947 is 0.31 Kg., that is 3.5 times the standard error. The difference is certainly *suggestive* of a significant downward departure from the linear increasing trend.

3. Discussion.

Our difficulty now is that we may not be justified in extending the trend in this way, obviously it is not extensible indefinitely and over a long period is bound to be not linear but likely to be oscillatory in character—we may at present be approaching or passing the peak of some long-term oscillation which, over a short period, is roughly linear. On the basis of 17 years (two of which contributed no information) we cannot adequately determine anything about long-term oscillations and very little about short ones (there is a suggestion, for example, of a short term oscillation of about 4 or 5 years).

With this in mind, a fall of 3.5 standard errors from the predicted value should be looked on with reserve. Falls of a similar magnitude have occurred in the past (1939 to 1941) and the present mean is still higher than in 1942. If we regard mean weight as increasing at a rate which is decreasing, which seems very reasonable, the 3.5 standard errors will be an overestimate of the true situation, in which case there might be no basis for asserting a significant drop when the errors of determining the grand mean, the year to year fluctuation and general curvilinear trend had been taken into account.

It might be necessary to modify these conclusions if further sets of data were examined and if ample time were available for a more detailed analysis of the existing data. (Mr. Plackett hopes to investigate these points in the future.)

4. Broad Conclusions.

(i) As far as the weights of boys in the age group 8 in the particular schools of the School Health Service enquiry are concerned, the evidence submitted is just suggestive of a downward trend in the mean weight.

(ii) We confirm the opinion of the Liverpool School Health Service that the above result, relating to a restricted number of schools, cannot be held to apply to Liverpool school children in general.

5. Recommendations.

We recommend that the valuable work of the Liverpool School Health Service in collecting statistical information relating to the physique of children should be extended as soon as possible to all maintained schools in the Liverpool area in order to obtain results applicable to the City as a whole.

Ideally every school child in the age group 5 to 15 should be subjected to periodic tests in order to keep a watchful eye on the health characteristics of Liverpool school children. Such a comprehensive enquiry would test the effect of national nutrition and other conditions on their physique. If facilities could be made available these tests should include

- (i) biological tests such as estimations of haemoglobin and vitamins,
- (ii) clinical examinations,
- (iii) simple periodic measurements of heights and weights.

It is quite understandable that for some time to come it will not be possible to undertake tests as comprehensive as those suggested above, but it is to be hoped that attention will be concentrated on (iii) and that the appropriate simple apparatus and services will be provided by the City Authorities.

We recommend that all schools in the area be invited to participate in the enquiry, and that the weight and height of every child be taken at least once a year. The weights should be correct to ± 0.1 kilograms, the heights to ± 0.5 c.m. If the measurements could be taken in the period ± 1 week round each birthday much laborious statistical analysis would be avoided. If this cannot be done then the date of birth of each child should be recorded when the measurements are taken, together with the date of measurement. As many children as practicable should be included in the enquiry, certainly not less than 20 per cent. of the total population of school children. The children should be randomly selected, and so should the schools from which they are chosen.

The system of stratification into Good, Fair and Poor schools employed by Liverpool School Health Service should be continued for the present in order to test whether or not there is a real difference in physique in the strata. In special circumstances, something along the following

lines might be possible. If, for example, there are A, B, C schools in the Good, Fair, Poor groups and the total roll calls in these schools are X, Y, Z, then the numbers of schools chosen for enquiry in any particular year might be in the approximate proportion of A to B to C and the total numbers of children might be in the approximate proportion X to Y to Z. Finally, it is important to ensure that at the time of measurement and weighing, the children should wear as little clothing as possible, preferably of the type recommended for gym. work.

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